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Mindfulness And Relationship Health In Couples With Chronic Pain

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MINDFULNESS AND RELATIONSHIP HEALTH IN COUPLES WITH CHRONIC PAIN

by

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THESIS

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CHAPTER 1

INTRODUCTION

Chronic pain conditions are a common problem, affecting approximately 20% of the population (Blyth, March, Brnabic, & Cousins, 2004; Miller & Cano, 2009). Chronic pain is defined as pain lasting 6 months or longer and individuals with chronic pain are more likely to be female, of lower socioeconomic status, unemployed, have less education and be middle age (Blyth et al., 2001; Miller & Cano, 2009). Further, chronic pain is associated with a number of negative outcomes, including comorbid mood disorders, such as pain-related anxiety and depression (McCracken, Gauntlett-Gilbert & Vowles, 2007; Miller & Cano, 2009), marital distress (Flor, Turk & Scholz, 1987; Geisser, Cano & Leonard, 2005), increased pain catastrophizing (Sullivan, Bishop & Pivik, 1995), and increased health-care utilization (Blyth, March, Brnabic, & Cousins, 2004). Additionally, chronic pain is estimated to cost \$215 billion annually in health-care utilization, disability and lost income (Academy of Orthopedic Surgeons, 1999).

Historically, most research on individuals with chronic pain has focused on the individual and his or her physical and mental well-being. Recently, more research on chronic pain has focused on the interpersonal relationships of individuals with chronic pain, examining the impact of these relationships on health outcomes and the impact of the chronic pain on these relationships (Flor, Turk & Scholz, 1987; Geisser, Cano & Leonard, 2005; Romano, et al., 2000; Turk, Kerns & Rosenberg, 1992). As one can imagine, chronic pain does not affect only the patient, but the marriage, family and interpersonal relationships in which the individual with chronic pain is involved.

Given that chronic pain occurs in a social context, research on the interplay between intrapersonal and interpersonal factors is needed. The purpose of this study is to investigate the role of mindfulness and empathy as they affect the multidimensional experience of pain and relationship satisfaction in couples with chronic pain. I first present the prominent theories of the social context of chronic pain. Then I introduce the concept of mindfulness and review the research on the effects of mindfulness on individual and couples variables, such as physical and mental health and relationship satisfaction. Finally, I review the research on the effects of mindfulness on empathy within intimate relationships.

Chronic Pain in the Social Context

Chronic pain, as a long-term physical condition, would be expected to impact not only the individual with chronic pain, but those with whom they have intimate relationships, such as romantic partners or their children. Researchers interested in the social context of pain have focused primarily on the marital dyad, investigating how the presence of chronic pain affects the individual with chronic pain, the spouse and the relationship. The operant model of pain is a theory of chronic pain within the social context and posits that through learning, pain behaviors in the individual with chronic pain can be developed and maintained by responses from those in their social network, particularly intimate partners (Fordyce, 1982). In accordance with this model, a partner's positive responses (i.e., solicitousness), as perceived by the individual with chronic pain, towards the individual with chronic pain has been related to an increase in pain behaviors, reports of pain severity and disability, while decreasing activity levels because, theoretically, the solicitousness reinforced the pain-related behaviors (Flor,

Kerns & Turk, 1987; Romano et al., 2000; Turk, Kerns & Rosenberg, 1992). Conversely, punishing partner responses towards the individual with chronic pain has been related to decreases in pain behaviors and disability and increases in activity level, as well as psychological distress (Romano et al., 2000).

Another theory of chronic pain in the social context is a cognitive-behavioral transactional theory. This transactional theory posits that the multidimensional experience of pain by the individual is a complex interaction between the individual's biological, behavioral, cognitive and affective vulnerabilities and the challenges or stressors that the individual faces as part of the pain (Turk, Meichenbaum & Genest, 1983). This theory recognizes that these intrapersonal interactions take place within a social learning environment, consisting of intimate relationships with others, which selectively reinforces and punishes certain behaviors and that all those in the environment make cognitive appraisals (i.e., perceptions) of behavioral interactions based on their individual learning histories (Turk, Meichenbaum & Genest, 1983). For example, the individual with chronic pain will make cognitive appraisals of his or her partner's behavior and behave in a certain way, and the partner will make appraisals of the individual with chronic pain's behavior and behave in a certain way. This creates a reciprocal transaction in which one's behavior is dependent on the appraisal and resultant behavior of another (Kerns & Otis 2003). These transactions have been shown to be mediated by individual's pain schemas, their appraisal of the pain experience, one's cognitive flexibility, and one's appraisals of whether or not he or she are successfully coping with the challenges of chronic pain (Kerns & Otis 2003). If these appraisals are positive, the individual does not appraise the pain as a threat. However, if

the appraisal of coping is negative, the individual will appraise the pain as a threat and will act in a way to decrease the threat by limiting activity and social isolation, leading to an increased experience of pain, disability and psychological distress (Kerns & Otis, 2003). These pain behaviors may be a way that individual's with chronic pain elicit nurturance and support in their attempts to cope with the threat, and increases in pain behaviors have been seen in unsupportive environments, such as distressed intimate relationships (Romano, Turner & Jensen, 1997).

Though not directly a social context theory, McCracken (2005) proposed a cognitive model of chronic pain that is relevant to social interactions. This model hypothesizes that individuals with chronic pain are affected by restricted awareness, overwhelming influences of distressing thoughts and feelings, and habitual patterns of ineffective avoidance of these thoughts and feelings. These behaviors act to increase suffering and disability in those with chronic pain, leading to the negative outcomes frequently seen, such as depression, anxiety, relationship distress, pain experiencing and pain catastrophizing (McCracken, 2005). Similar theories to this cognitive model of chronic pain have been applied in new models of cognitive-behavioral therapy for chronic pain, such as Acceptance and Commitment Therapy for Chronic Pain (Dahl, Wilson, Luciano & Hayes, 2005), which employs mindfulness and acceptance as a central component to increase awareness and decrease ineffective avoidance of thoughts and feelings.

McCracken (2005) posited that for some, chronic pain leads to a preoccupation with pain, negative thinking about their situation, engaging in emotional suffering as a result of their thoughts and feelings and becoming stuck in a repeating pattern of

unsuccessfully struggling with their pain, thereby limiting their functioning. This theory is largely based on earlier work by Eccleston and Crombez (1999) that looked at numerous studies on the demands of pain on individual's attention. They hypothesized that pain was a signal to the body to avoid or escape the situation and demands the mind's full attention to meet this goal such that very little can distract an individual in pain from the pain for very long. Further, because the pain signal is so important to species survival, it will interrupt attention from all other tasks. However, in chronic pain conditions, the situation cannot be avoided, and individuals with chronic pain find themselves in a physically and emotionally restricted environment that is dominated by pain and disability, while fearing more pain and disability (Eccleston & Crombez, 1999).

McCracken, Gauntlett-Gilbert, and Vowles (2007) believe that individual mindfulness, or present-focused, non-judgmental awareness, plays a role in affecting the cognitive patterns in individuals with chronic pain, which then affects the overall health outcomes in these individuals. However, there has been little research on the relational nature of acceptance and mindfulness, which is important because of the social context of pain appraisals and behaviors. For example, how one person manages his or her own thoughts and feelings may affect their interactions with other people. In particular, a spouses' ability to remain in the present in a nonjudgmental manner might affect whether he or she reacts positively or negatively to the partner in pain.

In sum, the available models of pain suggest that intimate relationship partners such as spouses have crucial roles to play in the adjustment of people with pain. They may reinforce or punish pain behaviors or interpret pain in ways that affect their responses to people with pain. Newer models also suggest that mindfulness may play a

role in these interactions between patients and spouses. As the social context of pain is a relatively new area of research there is a need to explore associations between spousal characteristics and patient adjustment in order to develop treatments aimed at improving overall health for couples with chronic pain. The next step in achieving this goal is to identify important intrapersonal and interpersonal factors, such as mindfulness and empathy, respectively, which may account for the association between chronic pain and outcomes in individuals with chronic pain. The purpose of this study is to identify mindfulness and empathy as correlates of chronic pain adjustment and relationship health.

Mindfulness

Mindfulness is the act of paying attention to the present moment in a particular way (Kabat-Zinn, 1994). It has recently been adapted to modern psychotherapy and has been defined in many different ways. Some have defined mindfulness as the act of intentionally paying attention to the present moment in a non-judgmental way (Kabat-Zinn, 1994; Linehan, 1993; Marlatt & Kristeller, 1999). Others have defined mindfulness as having two components; attention or awareness and acceptance (Baer, 2003; Bishop et al., 2004; Brown & Ryan, 2003; Hayes & Wilson, 2003). Awareness refers to the individual's subjective experience of both internal and external stimuli, encompassing one's reality in the moment, while attention refers to the focusing of awareness on specific aspects of this reality (Brown & Ryan, 2004). Acceptance refers to the surrender to this reality, as it truly is, without trying to change the reality, judge it or get stuck in any particular moment (Brown & Ryan, 2004). Conversely, mindlessness is defined as the absence of mindfulness, in which individual's refuse to acknowledge or

attend to their subjective experience of internal or external stimuli and may be defensively motivated to protect themselves from experiencing these stimuli (Brown & Ryan, 2003).

One of the more comprehensive definitions of mindfulness posits that there are multiple facets to mindfulness, with each facet having a different potential impact on individual behavior and cognition. Baer et al. (2006) looked at the different facets that individual mindfulness measures were incorporating and discovered five facets to mindfulness: observing, describing, acting with awareness, non-judging of inner experiences and non-reactivity to inner experience. Observing refers to the individual attending to or noticing internal and external stimuli (e.g., sensations, emotions, cognitions, sights, sounds, and smells), similar to Brown and Ryan's (2004) "awareness" and "attention". Describing refers to the individual's ability to note or mentally label these stimuli with words. When individuals are acting with awareness, they are attending to their current actions instead of behaving automatically or absent-mindedly. Similar to Brown and Ryan's (2004) "acceptance", non-judging of inner experiences refers to individuals' ability to refrain from evaluating their internal experiences (e.g., cognitions, sensations and emotions) and non-reactivity of inner experiences refers to individuals' ability to allow thoughts and feelings to come and go, without getting stuck in any particular thought, feeling or moment (Baer et al., 2006). It was further found that three of these facets; non-reactivity, non-judging, and acting with awareness; were strongly related to psychological symptoms in particular (Baer et al., 2006).

Finally, Brown and Ryan (2003) hypothesize that mindfulness is a skill that can be strengthened through training, in addition to being a personality trait present in all people. They speculate that everyone has the ability to be mindful, but that individuals vary on their propensity or willingness to be aware and attentive to the present and training can alter this willingness. Further, they argue that individual mindfulness will vary within the person as well, with mindfulness being affected by the individual and situational factors, such as mood, and interpersonal interactions (Brown & Ryan, 2003).

Effects of Mindfulness on Individual Health. Numerous studies have demonstrated the relationship between mindfulness and individual health variables across both clinical and non-clinical populations. Higher self-reported, individual mindfulness has been related to increased self-knowledge, autonomy, and emotional self-regulation, allowing individuals to act in accordance with their own values, goals and interests in non-clinical populations (Brown & Ryan, 2003). These traits are hypothesized to lead to decreased mood disturbance and stress in individuals with high mindfulness. Conversely, those low in mindfulness are more likely to report depression, anxiety, stress and impulsive actions (Brown & Ryan, 2003). Carmody and Baer (2008) reported on the mediation of mindfulness on the associations between formal mindfulness meditation practice time as part of a Mindfulness-Based Stress Reduction (MBSR) course and decreases in both psychological and medical symptoms and perceived stress and increases in psychological well-being, also in non-clinical populations. Further, Shapiro, Schwartz and Bonner (1998) found that mindfulness training in medical students was related to increases in empathy for others and decreases in self-reported depressive and anxiety symptoms and stress. Finally, Kabat-

Zinn et al. (1982, 1985, & 1987) and McCracken et al. (2007) found that increased mindfulness in populations with chronic pain was related to improvements in ratings of pain, disability and other medical symptoms, as well as psychological symptoms (i.e., depression and pain-related anxiety), and increases in biological markers of well-being such as melatonin, which has been related to improved immune function.

These results indicate that engaging in mindfulness, whether as a personality trait or through ongoing practice, acts to reduce negative health outcomes, while also increasing positive outcomes, through decreasing one's automatic thoughts and behaviors and increasing self-regulation of emotion and behavior. With these results, research has been directed at applying mindfulness training to the treatment of psychological disorders, such as depression, anxiety and borderline personality disorder; stress; and medical conditions, such as chronic pain, cancer, fibromyalgia, psoriasis and hypertension. In the proposed study, I will measure mindfulness using a self-report measure examining the five facets of mindfulness. I expect that mindfulness will be negatively related to psychological distress, such as depression and anxiety, and chronic pain.

Mindfulness and Chronic Pain. Researchers hypothesize that mindfulness practice may act similarly to exposure therapy, with individuals engaging in prolonged exposure to the sensations of chronic pain, without the catastrophic consequences they expect, leading to desensitization to the experience and a reduction in the emotional responses connected to the pain experiences (Kabat-Zinn, 1982). Kabat-Zinn (1982) proposes that these changes should lead to the individual with chronic pain experiencing the pain sensations without the excessive emotional reactivity, further

leading to a reduction in suffering or distress, even if the pain sensations themselves were not reduced.

Both Kabat-Zinn (1982) and, more recently, McCracken et al. (2007 & 2009) propose that mindfulness increases emotional regulation through present-moment awareness, instead of the typical avoidance engaged in by some individuals with chronic pain. Mindfulness thus alters the cognitions of individuals with chronic pain in such a way that they are able to decrease their automatic responses or behaviors, leading to a more balanced, non-judgmental, non-reactive stance and more effective action. This more effective action is less caught up in any distressing thoughts or feelings.

With this mechanism in mind, McCracken, Gauntlett-Gilbert and Vowles (2007) looked at the role of mindfulness, without training, in the context of a cognitive-behavioral analysis of chronic pain-related suffering and disability. They found that increased mindfulness was related to increased acceptance of one's pain, decreased reported pain and disability, emotional distress, depression, pain-related anxiety and cognitive functioning problems and decreased medication use. Further, mindfulness significantly predicted physical, social, cognitive and emotional functioning in individuals with chronic pain, even after controlling for background characteristics, pain, and acceptance of pain (McCracken, Gauntlett-Gilbert & Vowles, 2007). Thus, I expect that individuals' mindfulness will be negatively related to reported pain disability, and depression but positively related to activity.

Mindfulness and Interpersonal Relationships. Despite this information about the positive impacts of mindfulness on individuals' well-being in both clinical and non-clinical

populations, there has been very little research on the impact of mindfulness on relationship variables in the dyad, particularly among couples with chronic pain. Researchers have investigated the extent to which mindfulness of the individual and mindfulness of the spouse affects marital satisfaction in non-clinical populations. This research has shown that mindfulness contributes to greater marital satisfaction in many ways. Shaver et al. (2007) assessed mindfulness and attachment style in older adults and found that attachment anxiety was related to lower scores on the non-reactivity to inner experience, non-judging of experience and acting with awareness scales of the Five-Facet Mindfulness Scale, while avoidant attachment was related to lower scores on all five facets of mindfulness. The researchers interpreted these findings as indicating that more attachment-anxious people were less capable of maintaining a non-reactive, non-judgmental stance toward their experience, possibly leading to more conflict within their relationships. Likewise, more avoidant people were less mindful, thereby less able to notice their experiences or put them in words, also possibly contributing to relationship conflicts and disharmony (Shaver, Lavy, Saron, & Mikulincer, 2007). Barnes et al. (2007) have found evidence in couple's interactional studies that supports the hypothesis that more mindful individuals have better relationships. In their short-term, longitudinal study, Barnes et al. (2007) used multilevel modeling and found higher mindfulness was related to increased relationship satisfaction, feelings of love and commitment and decreased emotional stress response to relationship conflict, anger and hostility going into a conflict discussion. The researchers interpreted their results to indicate that more mindful individuals view their romantic relationships more positively and have relationships that are lower in emotional and behavioral negativity

(Barnes et al., 2007). The impact of mindfulness on relationship satisfaction is interesting as previous research has connected relationship satisfaction and psychological disorders, such as depression and anxiety (Beach & O'Leary, 1993; Whisman & Uebelacker, 2009). In research with couples with chronic pain, the association between relationship satisfaction and psychological distress has also held true (Cano, et al., 2004; Cano, Weisberg, & Gallagher, 2000). However, there has been little research on the effects of mindfulness on relationship satisfaction in couples with chronic pain.

Burpee and Langer (2005) hypothesized that many couples have developed a negative pattern of interacting during conflicts which acts to intensify the original conflict and the emphasis of the conflict shifts from finding a solution to assigning blame. They believed that individual mindfulness allowed at least one person in the couple the ability to act more mindfully, or less mindlessly, and, by doing so, would be able to break the negative patterns of automatic responses and be more likely to consider their partner's point of view (Burpee & Langer, 2005). In this study, Burpee and Langer (2005) found that 8% of the variance in marital satisfaction could be attributed to individual mindfulness. Given McCracken's (2007) hypothesis regarding chronic pain leading to a restricted awareness and a cyclical pattern of negative, automatic responses, it would seem that investigating the role of mindfulness in couples with chronic pain may yield valuable results. Other research has supported this interpersonal hypothesis. Wachs and Cordova (2007) found that individual mindfulness contributed to relationship satisfaction by creating a more relationally skillful emotional repertoire, and interpreted this as allowing the couple to interact in a way that each person was able to see the

other more clearly, non-judgmentally, with less emotional reactivity, lending to a smoother interaction during emotionally challenging situations. These results would indicate that one partner's mindfulness has the ability to impact the relationship satisfaction of the other partner in the relationship.

Finally, in an intervention study by Carson et al. (2004), couples participated in a mindfulness-based relationship enhancement program that sought to increase individual and relationship mindfulness. They found that mindfulness training in couples increased individuals' coping abilities, optimism and relaxation, leading to improvements in relationship satisfaction, autonomy, closeness to partner, acceptance of partner and relationship distress (Carson et al., 2004). Currently, this study remains the benchmark of mindfulness-based intervention studies for couples; however, it did not directly measure mindfulness, though it attributes the changes to an increase in mindfulness. Given this research on mindfulness and relationship satisfaction, the spouse's mindfulness is expected to relate to more positive, responsive spouse interaction behaviors as well as patient relationship satisfaction in the proposed study.

Empathy and Mindfulness

It is also possible that spouse's mindfulness promotes empathy toward patients with pain. Mindfulness has been related to increased empathy and greater distress tolerance (Wachs & Cordova, 2007). Empathy is defined as a sense of knowing the experience of another person and has cognitive, affective and behavioral components (Goubert et al., 2005). This sense of knowing can lead to the observer having responses to another's distress that are oriented to the self (e.g., distress) or oriented to the other (e.g., sympathy) and these responses have different behavioral

consequences. Self-oriented responses will motivate the observer to focus on his or her personal distress; whereas other-oriented responses will motivate the observer to help the other in distress (Goubert et al.). Goubert et al. propose that empathy depends on both patient and spouse characteristics. For example, the facial expressions of pain in an individual with chronic pain helps convey information about the extent of pain; whereas, the observer's own prior experiences with pain may help to sense another's distress. Spouses' characteristics include cognitive processes related to intentionality of pain expression, personal expectancies, decision-making and interpersonal judgments that are based on their previous experiences. These characteristics in couples with chronic pain can interfere with empathic responding to one's partner and delivering effective care to the individual with chronic pain (Goubert et al.).

Mindfulness is one spousal characteristic that may act to increase one's empathy for others through the openness and curiosity for one's own experience leading to increased other perspective-taking, while also being less focused on one's personal distress (Wachs & Cordova, 2007). Indeed, Lesh (1970) found an increase in empathic engagement and ability in counselors following meditation training. Further, after meditation training, Beitel et al. (2005) found that students' mindfulness was positively associated with empathic concern and perspective taking factors of empathy and negatively associated with personal distress. By increasing this perspective-taking, possibly through decreasing self-oriented distress, the effect of mindfulness on empathy may also allow for more accurate perceptions of another's distress (i.e., empathic accuracy), which is considered important to relationship satisfaction (Ickes, 2001) and delivering effective care to those in pain (Goubert et al., 2005). Further, this increase in

empathy is likely to lead to more relationship-enhancing behaviors, such as accommodation, and mindfulness has been found to increase one's ability to validate one's partner's experiences, which increases relationship satisfaction and decreases relationship dissolution (Block-Lerner et al., 2007; Dekeyser et al., 2008). Thus, I expect that empathy will be directly related to mindfulness and that empathy will mediate the association between mindfulness and relationship satisfaction

Two forms of empathy were examined in this study: empathic concern and perspective taking. Empathic concern (EC) assesses feelings of sympathy and concern for others, whereas perspective taking (PT) assesses the individual's ability to take the psychological point of view of another spontaneously (Davis, 1980). It is important to look at both forms because they comprise important aspects of empathy. Further, researchers found different correlates of the two forms. For example, PT has been found to be highly related to better social functioning, possibly through smoother interpersonal interactions, and higher self-esteem, while EC has not been consistently related to either social functioning or self-esteem (Davis, 1980). However, both EC and PT have been related to measures of unselfish concern or sensitivity to others (Davis, 1980). These results indicate that EC and PT are separate constructs of empathy, yet still both measures of empathy, and that it would be important to include both as a measure of empathy for another person. It is expected that EC and PT would behave similarly in relation to mindfulness, however they do tap different aspects of empathy. Currently there is not enough research to suggest that EC and PT would correlate with mindfulness in different ways, though the possible differences were explored in this study.

The Current Study

As demonstrated in a handful of studies, increased mindfulness can have positive effects on individual health and relationship variables. However, there have been no studies investigating the association of mindfulness with individual and relationship variables in couples with chronic pain. In particular, partners' responses toward individuals with chronic pain are important because partners are typically the care provider for individuals with chronic pain and his or her responses can aid or hinder pain management and other pain interventions, thereby affecting individual and relationship variables in couple's with chronic pain.

Furthermore, no studies have examined the impact of individual mindfulness in partners. Therefore, this study is likely to make an important contribution in the literature on mindfulness, relationships and chronic pain by showing that mindfulness in an individual and within a dyad can contribute to or alleviate the individual and relational problems seen in couples in which one partner has chronic pain. It is also possible that the pain experience of the individual with chronic pain may be mediated through positive partner responsiveness. This knowledge could lend itself to addressing some of the complaints couples have about the impact chronic pain has on their lives.

The goal of the current study is to identify mindfulness, empathy and perceived support in marital relationships, all characteristics of a healthy marital relationship, as important correlates of mental health, relationship health, and health-related quality of life in married couples. I will pursue this goal by examining the following aim:

Within chronic pain couples, I will determine the extent to which spousal and patient mindfulness are associated with physical, mental and relationship health variables for the individual with chronic pain.

Hypotheses:

- 1) *Mindfulness and spouse's support behaviors:* Patient's and spouse's mindfulness will be positively correlated with spouse's empathy (i.e., empathic concern and perspective-taking), patient-reported perceived partner support (i.e., perceived partner responsiveness) and patient-reported positive spouse responses to patient's pain (i.e., solicitous spouse responses to pain). Conversely, patient's and spouse's mindfulness will be negatively correlated with patient-reported spouse punishing responses to patient's pain (i.e., negative spouse responses to pain).
- 2) *Mindfulness and patient's adjustment:* Patient's and spouse's mindfulness will be negatively related to patient-reported pain and psychological adjustment variables (i.e., pain severity, interference, general psychological distress), but positively related with patient's relationship adjustment (i.e., marital satisfaction).
- 3) *Spouse's support behaviors and patient's adjustment:* Spouse's empathy (i.e., empathic concern and perspective taking) will be positively correlated with patient's adjustment (i.e., patient-reported general psychological distress and marital satisfaction), while negatively correlated with patient's pain adjustment variables (i.e., pain severity and interference). Patient-rated perceived partner responsiveness and solicitous spouse responses to patient's pain will also be positively correlated with patient's adjustment and negatively correlated with

patient's pain adjustment variables. Finally, patient-rated negative spouse responses to patient's pain will be negatively related to patient's adjustment and positively related to patient's pain adjustment variables.

- 4) *Spouse support behaviors as mediators*: The association between spouse's mindfulness and patient's adjustment (i.e., patient-reported pain severity, interference, general distress and marital satisfaction) will be individually mediated by four variables; the spouse's empathy (i.e., empathic concern and perspective taking), as well as spouse's support behaviors (i.e., perceived partner responsiveness, solicitous and negative spouse responses to pain). Patient's mindfulness will be included when possible to determine the extent to which spouse's mindfulness predicts mediators and dependent variables above and beyond patient's mindfulness.
- 5) *Exploratory Analysis of Mindfulness*: The interaction of spouse's and patient's mindfulness will be tested in a regression model predicting each of the mediators (i.e., spouse's support behaviors) and dependent (i.e., patient's adjustment) variables. As this is an exploratory analysis there are no specific expectations for outcomes. Further, the mediation of spouse's mindfulness on the association between patient's mindfulness and patient's adjustment and patient's mindfulness and spouse's support behaviors will be tested. Again, as this is an exploratory analysis, there are no specific expectations for outcomes.

CHAPTER 2

METHODS

Participants

Participants were 51 chronic pain couples (102 participants) who had previously participated in a longitudinal study of chronic pain in couples conducted in the Relationships and Health Lab at Wayne State University. The couples were recruited through newspaper advertisements in local papers, announcements made on the university's electronic bulletin board and other traditional bulletin boards. The sample was diverse for both patients (52.1% Caucasian, 43.3% African American, 2% Hispanic, 2% Asian), and spouses (59.2% Caucasian, 38.8% African American, 2% Asian). The gender of the patients was balanced with 52.9% male ($n = 27$). The average ages of patients and spouses were 58.16 years ($SD = 12.45$) and 58.35 years ($SD = 13.34$), respectively. Patients reported an average pain duration of 14.04 years ($SD = 13.15$). There were no significant differences on age or pain duration between male and female patients. On average, couples were married for 28.73 years ($SD = 20.12$). The participants were well educated with patients averaging 15.24 years ($SD = 3.06$) of education and spouses averaging 14.43 years ($SD = 2.97$). The three most common pain locations in patients included the lower back (52%, $n = 26$), hip (12%, $n = 6$), and knee (10%, $n = 5$). Chronic pain in both partners was present in 43% ($n = 22$) of the couples that completed this phase of the longitudinal study.

Materials

Demographics. Each couple member reported on their age, education, employment status, race/ethnicity, date of marriage, areas of chronic pain, intensity and duration.

Mindfulness by the participant was measured by the *Five Factor Mindfulness Questionnaire* (FFMQ; Baer et al., 2006). The FFMQ assessed the way that people think about everyday events. The five facets included observing, describing, acting with awareness, non-reactivity to inner experiences, and non-judgment of experiences. The range of the scale is from 39-195, with higher scores indicating greater individual mindfulness. It has good reliability and validity and greater mindfulness is related to less personal distress (Baer et al., 2008). Spouses' mean FFMQ score was 135.97 (SD = 16.12) and patient's mean FFMQ score was 141.61 (SD = 18.42), which were slightly higher than the means reported by Baer et al. for a sample of college students but similar to the mean reported for highly educated people. The reliability for the current sample was good for spouses ($\alpha = .83$).

Individual differences in empathy were assessed using the Davis *Interpersonal Reactivity Index* (IRI; Davis, 1980). This multidimensional approach to measuring empathy consists of four scales which tap both cognitive and affective components of empathy, and this study utilized two of the four scales: The Perspective Taking Scale (PT) "reflect(s) a tendency or ability of the respondent to adopt the perspective or point of view of other people" (p. 117, Davis, 1980). The Empathic Concern Scale (EC) measures "a tendency for the respondent to experience a feeling of warmth, compassion, and concern for others undergoing negative experiences" (p. 117, Davis,

1980). The PT scale comprises the "cognitive" component of Davis's empathy test with items such as "I try to look at everybody's side of a disagreement before I make decisions." Respondents completed 14 items rated from 0 to 4, with 0 being "does not describe me well" and 4 being "describes me very well", and received scores on each of the two subscales of the IRI, each measuring a different component of empathy. The range of the subscales is 0-28, with higher scores indicating higher ability in that component of empathy. Each participant completed the 14 items of the IRI presented in randomized order, however, for this study, only the spouses' scores were considered. The spouses mean IRI score was 38.96 (SD = 9.20) and their mean scores on empathic concern and perspective taking subscales were 17.54 (SD = 4.21) and 18.30 (SD = 4.83), respectively, indicating that the spouses were, on average, moderately empathic. The reliability in this sample was good for the combined IRI ($\alpha = .85$) and moderate for the empathic concern and perspective taking subscales ($\alpha = .75$ and $.73$, respectively). Though EC and PT were highly correlated ($r = .75$, $p < .001$), there were differences between EC and PT and their relationship with spouse's mindfulness ($r = .20$, $p = .15$ and $r = .28$, $p < .05$, respectively), and the combined IRI was not related to spouse's mindfulness ($r = .26$, $p = .60$), as such, EC and PT were considered individually in the model.

Perceived partner responsiveness (PPR; Reis, Clark, & Holmes, 2004) was used to measure the participant's belief that his or her relationship partner is cognizant of, sensitive to, and behaviorally supportive of the participant. The PPR items tap personality dispositions, partner-specific attributions, attributions of communication and interaction process, and meta-cognition. The participants reported on their perception of

their partners on a scale from “Not at all true” (1) to “Completely true” (9). The range of the PPR is from 18-162. The PPR is frequently used in relationship research and has good reliability and validity (Reis, Clark &, Holmes, 2004). Though each participant completed the PPR, for this study only the patient’s scores were considered. The patients’ mean PPR score was 107.90 (SD = 39.52), indicating that the average patient in this sample perceived his or her spouse to be moderately responsive to the patient. The reliability for this scale in the current sample was excellent ($\alpha = .98$).

The *West Haven-Yale Multidimensional Pain Inventory* (WHYMPI; Kerns, Turk, & Rudy, 1985) is a 52 item self-report questionnaire that assessed clinical pain using a 7-point Likert Scale. In our study it was used to assess the impact of pain on the individual with chronic pain’s life, or the pain interference (9 items), and the responses of the spouse to the individual with chronic pain’s communication of the pain (i.e., punishing/negative; my partner “ignores me”, expresses irritation/anger/frustration with me”, or solicitous spouse responses; my partner “asks what they can do to help”, “takes over jobs or duties”, 4 and 6 items, respectively). The participant answers questions regarding their pain or spouses responses from never occurring (0) to frequently occurring (6). The range for the interference scale is 0-54, solicitous spouse response scale is 0-36, and negative spouse response scale is 0-24. These scales have been used with a variety of clinical pain samples, including individuals with chronic pain, and have good reliability and validity (Junghaener, Keefe & Broderick, 2009; Kerns, Turk & Rudy, 1985). Though there is a spouse version of the WHYMPI, in which the spouse rates the patient’s pain and their own behavior, only the patient’s ratings were considered for this study. The average reported pain interference was 29.98 (SD =

14.84), solicitous spouse response was 21.86 (SD = 9.66), and negative spouse response was 6.52 (SD = 5.48). Overall, the patients in the sample reported, on average, moderate pain interference and solicitous spouse responses and minimal negative spouse responses. The reliability for these scales in this sample was excellent for pain interference ($\alpha = .96$) and good for solicitous spouse responses and negative spouse responses ($\alpha = .88$ and $.82$, respectively).

The *Brief Pain Inventory* (BPI; Cleeland, 1989) was used to assess pain severity. The BPI included 4 items that assessed pain severity as the worst and least in the last 2 weeks, the average and current pain severity on an 11-point Likert Scale item. For the purposes of this study, we used an average of the average and current pain severity to indicate pain severity. The range for each of these scales is 0-10, with 0 indicating “No pain” and 10 indicating “Pain as bad as you can imagine”, and the combined pain severity scores could range from 0-20. On this scale higher scores indicate greater pain severity. The BPI has been used widely with a variety of clinical pain samples, including chronic, surgical and acute pain, and has good reliability and validity (Cleeland, 1989). Again, though both participants completed these scales, only the patient’s scales were considered for this study. The pain severity reported by the patients was 4.77 (SD = 2.58), indicating that the patients were, on average, experiencing moderate pain severity. The reliability of this combined scale in this sample was good ($\alpha = .88$).

The *Dyadic Adjustment Scale* (DAS; Spanier, 1976) was used to assess relationship satisfaction. The scale consisted of 32 items that measure agreement on a variety of topics (e.g., finances, world views), degree of affection, and general marital happiness. The range of the scale was from 0-151 with higher scores indicating greater

marital satisfaction. This scale has been used with pain samples in the current literature and has excellent reliability and validity with this group (Romano, Turner, Jensen, 1997). In this sample the DAS was completed by all participants, however, only the patient's DAS was considered for this study. The average patient DAS score was 108.59 (SD = 18.11), indicating that the patients were, on average, satisfied in their relationships. The reliability in this sample was excellent ($\alpha = .94$).

The *Mood and Anxiety Symptom Questionnaire* (MASQ; Watson, & Clark, unpublished manuscript) is a 90 item self-report measure that assesses and discriminates between depression and anxiety. Participants reported on how much they have experienced different sensations, problems and feelings in the past week on a 1 to 5 scale, with 1 being "not at all" and 5 being "extremely". The questionnaire has five subscales, three of which measure general distress common to depression and anxiety, an anhedonic depression subscale and an anxious arousal subscale. For the purposes of this study, only the three general distress scales (15 items mixed symptoms, 12 depressive symptoms and 11 anxious symptoms) were used to measure the non-specific psychological distress of the individual with chronic pain. Higher scores indicated greater general psychological distress and the range of this scale is 38-190. The MASQ has shown good reliability and validity in chronic pain samples (Geisser, Cano, & Foran, 2006). Both patients and spouses completed the MASQ in this sample, though only the patient's scores were considered for this study. The average patient score for general psychological distress was 80.49 (SD = 25.16), indicating that the patients in this sample were, on average, experiencing moderate general distress as compared to other samples of chronic pain patients (Geisser, Cano & Foran, 2006). The

reliability for the MASQ general distress scale in this sample was excellent ($\alpha = .95$).

Procedure

The data for this study was collected at the fourth wave of a longitudinal study on couples with chronic pain. The participants from previous time-points were sent a postcard inviting them to participate by contacting the Relationships and Health Lab at Wayne State University to obtain a survey packet. Those couples that contacted the Lab were mailed a survey packet that contained consent forms and questionnaires labeled for the pain-patient and the healthy spouse. In order for a patient or a spouse to qualify as having a chronic pain condition, the pain must have been present almost daily for a minimum of 6 months. In each couple, one member was identified as the patient if both partners reported that his or her pain was the most severe. The spouse, even if they also reported chronic pain, was referred to as the healthy spouse. The pain-patient and healthy spouse both completed identical measures relating to the pain patient's experience of his or her own pain or the healthy spouse's perceptions of the pain patient's pain. Instructions to complete these surveys individually and seal them in the postage-paid provided envelope were included. Couples were compensated \$50 for their participation in this phase of the longitudinal study, at which time they were also debriefed about the purpose of the study.

CHAPTER 3

RESULTS

Power Analysis

The GPower program was used to estimate power and necessary number of participants (Faul & Erdfelder, 1992). Power was calculated based on a medium effect size f^2 of .15 for the regression described below. Based on this, a sample size of 50 was deemed necessary to reach power of .80. Thus, the sample size of 50 couples is appropriate.

Preliminary Analyses

Data were checked for univariate and multivariate outliers and multivariate assumptions of normality. There were no univariate or multivariate outliers and the variables met the multivariate assumptions of normality. As such, there was no need for transformations of data and the data was analyzed in raw form below. Missing data analysis determined the data to be missing at random. The missing data were replaced with the item mean.

The baseline measures of participants who completed this phase of the longitudinal study were compared to those of non-completers. There were more similarities than differences between completers and non-completers. There were no significant differences between the completers and non-completers in race/ethnicity, spouse's and patient's education (in years), spouse's and patient's baseline marital adjustment, patient's baseline general psychological distress, or patient baseline pain severity. However, there were significant differences between the groups on patient's and spouse's age and length of marriage, with the non-completers being younger

(patient $M = 48.86$ in years, $SD = 13.15$, spouse $M = 48.97$, $SD = 13.08$; $t(106) = -2.72$, $p < .01$ and $t(106) = -2.45$, $p < .05$, respectively) and married a shorter length of time ($M = 18.82$ in years, $SD = 14.27$; $t(101) = -2.04$, $p < .05$), as well as general psychological distress of the spouse, with the non-completer spouses being more distressed ($M = 73.24$, $SD = 22.79$) than completers ($M = 64.48$, $SD = 18.44$, $t(106) = 2.17$, $p < .05$). These differences are described in the Discussion section as a potential limitation that affects the generalizability of the results.

Hypothesis 1: Mindfulness and Spouse's Support Behaviors

Pearson product-moment correlations were conducted to test the first hypothesis that patient's and spouse's mindfulness would be positively related to spouse's empathy (i.e., empathic concern and perspective-taking), patient-reported perceived partner support (i.e., perceived partner responsiveness) and patient-reported positive spouse responses to patient's pain (i.e., solicitous partner response to patient pain) (see Table 1). In addition, correlations were also conducted to test the hypothesis that patient's and spouse's mindfulness will be negatively related to patient-reported punishing spouse responses to patient's pain (i.e., negative spouse response to patient's pain) (see Table 1).

There were significant correlations in the expected directions between spouse's mindfulness scores and spouse's perspective taking, perceived partner responsiveness and negative spouse responses to patient's pain. However, spouse's mindfulness was not significantly related to spouse's empathic concern or solicitous spouse responses to patient's pain. Surprisingly, patient's mindfulness was not significantly related to spouse's mindfulness, although the correlation was in the expected direction (i.e.,

positive). Patient's mindfulness was significantly correlated only with perceived partner responsiveness.

Hypothesis 2: Mindfulness and Patient Adjustment

To test the second hypothesis that mindfulness would be negatively related to patient-reported pain adjustment variables (i.e., pain severity, interference), and general psychological distress, but positively related to patient's relationship adjustment (i.e., marital satisfaction), Pearson product-moment correlations were conducted (see Table 2). Again, correlations with patient's mindfulness were conducted with these variables in order to address the exploratory hypotheses (see Table 2).

There were significant correlations in the expected directions between patient's and spouse's mindfulness and patient's marital satisfaction and general psychological distress. However, the mindfulness variables were not significantly related to patient's pain severity or pain interference.

Hypothesis 3: Spouse's Support Behaviors and Patient Adjustment

Pearson product-moment correlations were conducted between the spouse's support behaviors (i.e., perspective taking, empathic concern, perceived partner responsiveness, solicitous spouse response and negative spouse response to patient's pain) and patient's adjustment (i.e., patient's marital satisfaction, general psychological distress, pain severity and pain interference) (see Table 3).

There was a significant and positive correlation between spouse's empathic concern and patient's marital satisfaction. Patient-rated perceived partner responsiveness and negative spouse responses to patient's pain were both significantly related to patient's marital satisfaction and general psychological distress. Patient-rated

solicitous spouse responses to patient's pain was significantly correlated to patient's marital satisfaction and patient's pain interference.

Hypothesis 4: Spouse's Support Behaviors as Mediators

Baron and Kenny's (1986) criteria were used to test the mediation hypotheses. First, the individual mediator variables (i.e., spouse's support behaviors; empathic concern, perspective taking, perceived partner responsiveness, solicitous spouse response and negative spouse response) must be significantly related to variation in the independent variable (spouse's mindfulness). Second, variation in the individual mediator variables (i.e., spouse's support behaviors) must be significantly related to variation in the individual dependent variables (i.e., patient's adjustment; patient's marital adjustment, general psychological distress, pain severity and pain interference) (see Figure 1 for a sample model). Finally, upon regressing the dependent variables on the independent variable and the mediation variables, the previously significant relationship between the independent variable and dependent variables should no longer be significant.

In testing Hypotheses 1-3, only two of the potential mediators – patient-rated perceived partner responsiveness and negative spouse responses to patient's pain – met criteria for testing the mediation model. Specifically, spouse's mindfulness was correlated with the potential mediators of perceived partner responsiveness ($r = .38, p < .05$) and negative spouse responses ($r = -.39, p < .05$). Perceived partner responsiveness was correlated with the dependent variables of patient's marital satisfaction ($r = .76, p < .001$) and patient's general psychological distress ($r = -.31, p < .05$). Negative spouse response was correlated with the dependent variables of

patient's marital satisfaction ($r = -.56, p < .001$) and patient's general psychological distress ($r = .40, p < .01$). Neither spouse's empathic concern nor solicitous spouse responses were significantly related to spouse's mindfulness; thus, they were not examined further in the mediation models.

Perceived partner responsiveness and negative spouse responses were tested in separate models to determine the extent to which these variables accounted for the association between spouse's mindfulness in predicting patient's marital satisfaction and general psychological distress. Because patient's mindfulness also met the mediation requirements for patient's marital satisfaction, I conducted a similar model to determine the extent to which perceived partner responsiveness and negative spouse responses mediated the association between patient's mindfulness and patient's marital satisfaction.

A multiple regression demonstrated that perceived partner responsiveness appeared to mediate the association between patient's mindfulness and marital satisfaction ($\beta_{\text{patient mindfulness}}$ changed from .32 [$p < .05$] to .09 [$p = .34$]; see Table 4). Further testing demonstrated that the indirect effect of perceived partner responsiveness was significant ($z = 2.14, p < .05$; Preacher, 2003).

Similarly, perceived partner responsiveness accounted for the effect of spouse's mindfulness on patient's marital satisfaction. Regression analyses revealed that the association between spouse's mindfulness and patient's marital satisfaction was fully mediated by perceived partner responsiveness ($\beta_{\text{spouse mindfulness}}$ changed from .45 [$p = .001$] to .19 [$p = .06$]; see Table 5). The Sobel test (Preacher, 2003) was also applied, demonstrating that the indirect effect of spouse's mindfulness on patient's marital

satisfaction via perceived partner responsiveness was significantly different from zero ($z = 2.65, p < .01$). Thus, these two sets of analyses show that patient's and spouse's mindfulness appear to explain the bivariate associations with patient's marital satisfaction. In testing the mediation by perceived partner responsiveness on the association of spouse's and patient's mindfulness and patient's marital satisfaction, spouse's mindfulness appears to account for the association between patient's mindfulness and patient's marital satisfaction. Perceived partner responsiveness accounts for additional variance in patient's marital satisfaction and some of the association between spouse's mindfulness and patient's marital satisfaction (see Table 6).

It was also hypothesized that perceived partner responsiveness would mediate the relationship between spouse's mindfulness and patient's general psychological distress. Regression analyses demonstrated that the relationship between spouse's mindfulness and patient's general psychological distress was not mediated by perceived partner responsiveness ($\beta_{\text{spouse mindfulness}}$ changed from $-.30 [p < .05]$ to $-.21 [p = .15]$; see Table 7).

In testing negative spouse responses as a mediator of the effects of spouse's mindfulness, two models were run; the first, predicting patient's marital satisfaction and the second, predicting patient's general psychological distress. It was hypothesized that patient-reported negative spouse responses would mediate the relationship between spouse's mindfulness and patient's marital satisfaction. Regression analyses revealed that the association between spouse's mindfulness and patient's marital satisfaction was fully mediated by perceived partner responsiveness ($\beta_{\text{spouse mindfulness}}$ changed from

.45 [$p = .001$] to .27 [$p < .05$]; see Table 8). The Sobel test (Preacher, 2003) demonstrated that the indirect effect of spouse's mindfulness on patient's marital satisfaction via negative spouse responses was significantly different from zero ($z = 2.30, p < .05$).

Similarly, regression analyses revealed that the association between spouse's mindfulness and patient's general psychological distress was mediated by negative spouse responses ($\beta_{\text{spouse mindfulness}}$ changed from $-.30$ [$p = .05$] to $-.17$ [$p = .24$]; see Table 9). The Sobel test (Preacher, 2003) demonstrated that the indirect effect of spouse's mindfulness on patient's general psychological distress via negative spouse responses was not significantly different from zero, but approached significance ($z = -1.86, p = .06$). Thus, perceived partner responsiveness appears to partially account for the association between spouse's mindfulness and patient's psychological distress but the indirect effect was not significant.

Exploratory Analyses

Exploratory analyses of an interaction effect between spouse's and patient's mindfulness were conducted to determine if the association between spouse's mindfulness and any of the mediator (i.e., spouse's support behavior variables) or dependent variables (i.e., patient's adjustment variables) depended on the level of patient's mindfulness. Step 1 of the hierarchical regression included the main effects of spouse's and patient's mindfulness. Step 2 included the multiplicative interaction of spouse's and patient's mindfulness. None of the regression models including the interaction term were significant.

Additional exploratory analyses were conducted to determine whether spouse's mindfulness mediated the association between patient's mindfulness and three variables: perceived partner responsiveness, patient's general psychological distress, and patient's marital satisfaction. These analyses would provide information regarding the relative importance of patient's compared to spouse's mindfulness in relating to patient-rated support and adjustment. These three dependent variables were chosen because they were significantly correlated with both mindfulness variables. Spouse's mindfulness and patient's mindfulness were not significantly correlated, thus violating the mediation rule of Baron and Kenny (1986). However, there is some degree of overlapping variance, approximately 5%, hence these mediation analyses were examined as part of the exploratory analyses.

A multiple regression analysis revealed that the association between patient's mindfulness and perceived partner responsiveness was mediated by spouse's mindfulness ($\beta_{\text{patient mindfulness}}$ changed from .30 [$p < .05$] to .23 [$p = .08$]; see Table 10). The Sobel test (Preacher, 2003) demonstrated that the indirect effect of patient's mindfulness on perceived partner responsiveness via spouse's mindfulness was not significantly different from zero ($z = 1.31$, $p = .19$).

A multiple regression analysis revealed that the association between patient's mindfulness and patient's general distress was not mediated by spouse's mindfulness ($\beta_{\text{patient mindfulness}}$ changed from -.43 [$p < .001$] to -.39 [$p < .01$]; see Table 11).

Further, a regression analysis revealed that the association between patient's mindfulness and patient's marital satisfaction was mediated by spouse's mindfulness ($\beta_{\text{patient mindfulness}}$ changed from .32 [$p < .05$] to .23 [$p = .08$]; see Table 12). The Sobel

test (Preacher, 2003) demonstrated that the indirect effect of patient's mindfulness on patient's marital satisfaction via spouse's mindfulness was not significantly different from zero ($z = 1.39$, $p = .17$). Thus, while there is some evidence that spouse's mindfulness accounted for the associations between patient's mindfulness and perceived partner responsiveness and patient's marital satisfaction, the indirect effect was not significant. However, spouse's mindfulness did not account for the associations between patient's mindfulness and patient's general psychological distress.

Finally, as indicated earlier (see Table 6), in testing the mediation by perceived partner responsiveness on the association of spouse's and patient's mindfulness and patient's marital satisfaction, spouse's mindfulness appears to account for the association between patient's mindfulness and patient's marital satisfaction. Specifically, the indirect effect of spouse's mindfulness is significant.

CHAPTER 4

DISCUSSION

Chronic pain is a multidimensional experience that is, as recent research has demonstrated, influenced by biological, psychological and social factors beyond the individual with chronic pain. Three psychosocial factors were investigated as correlates of mindfulness, empathic concern and perspective taking, and perceived support. Each of these variables has received some attention or is positively associated with patient psychological distress and marital satisfaction (Barnes et al., 2007; Brown & Ryan, 2003; Burpee & Langer, 2005; Carson et al., 2004; Dekeyser et al., 2008; Wachs & Cordova, 2007). In addition, these variables appear to be conceptually related, with greater mindfulness likely enhancing one's ability to be empathic and supportive toward a partner in pain. However, this is the first study to investigate these associations in couples with chronic pain and to investigate mediators of these associations.

Mindfulness and Spouse's Support Behaviors

In support of my hypotheses, spouse's mindfulness was associated with patient-rated perceived partner responsiveness and negative spouse responses to patient's pain, which are both spouse's support behaviors. To my knowledge, there is no research linking spouse's mindfulness with perceived partner responses in either healthy or chronic pain samples. However, these results are in line with other research indicating that spouse's mindfulness may enable the spouse to be more empathic towards their partner by decreasing their own reactivity and judgmental responses, thereby improving their ability to support their partner (Burpee & Langer, 2005). These support behaviors may be manifested in the ability to respond to the patient in a way in

which the patient perceives as understanding and caring, thus improving the patient's adjustment. For instance, spouses may ask questions to find out what the patient is thinking or feeling or may express positive emotions towards and encourage the patient. The association between mindfulness and negative spouse responses to patient's pain may also be explained in a similar manner; however, like perceived partner responsiveness, there is currently no research on this link. It is possible that a more mindful spouse is less likely to respond to his or her partner's pain by expressing frustration or anger with the patient because he or she is better able to recognize and regulate his or her own emotions, thereby expressing fewer negative emotions toward their partner (Burpee & Langer, 2005; Wachs & Cordova, 2007). It may also be that the association between mindfulness and spouse's support behaviors is mediated by empathic perspective taking, as discussed below. Nonetheless, further research is required in this area to shed light on these associations, particularly in chronic pain samples.

Spouse's mindfulness was not related to spouses' reports of empathic concern toward other people in general. However, spouse's mindfulness was related to greater perspective taking. The association between spouse's mindfulness and perspective taking is similar to previous research that proposes that the ability of individuals to be mindful or open to their own emotional experiences enables them to be open to other's experiences, thereby enhancing their ability to take another's perspective (Block-Lerner et al., 2007; Wachs & Cordova, 2007). However, in previous research, mindfulness has also been related to empathic concern which is in contrast to the current results. One possible reason for this is the type of mindfulness measure used in the current study. In

previous research, the most common mindfulness measure used was the Mindful Awareness Attention Scale (MAAS; Brown & Ryan, 2003). The MAAS is a 15-item Likert-type questionnaire which focuses on a specific component of mindfulness; sustained attention to the present. The MAAS pre-dates the mindfulness measure used in the current study, the Five Facets of Mindfulness Questionnaire (FFMQ; Baer et al., 2006), and the FFMQ does include many of the questions from the MAAS in its composition. However, the FFMQ measures five facets of mindfulness (i.e., observe, describe, accept, non-judgment and non-reactivity), as opposed to the one facet measured in the MAAS, which may account for the difference in the association between mindfulness and empathic concern. It is also possible that the FFMQ correlates with the perspective taking measure more because the FFMQ focuses on individual mindfulness and how individuals experience their intrapsychic (i.e., judging of one's own thoughts and feelings as good or bad) and sensory world (i.e., experiencing sounds, touch, sights and smells). For example, the FFMQ contains many items directly tapping the individual's ability to be non-reactive, non-judgmental, and accepting in situations, which may indirectly be related to increases in perspective taking. However, the FFMQ does not contain "other" directed items (e.g., asking about feelings towards another or ability for empathic concern). It may also be that the FFMQ is measuring the more cognitive aspects of mindfulness, which would be expected to correlate with perspective taking. Empathic concern, on the other hand, is an affective measure of empathy (i.e., feeling for another person) and would require an assessment of the affective component of mindfulness, which is not included in the FFMQ.

Spouse's mindfulness was also not related to solicitous spouse responses to patient's pain. The lack of association between spouse's mindfulness and solicitous spouse responses and the demonstrated association between spouse's mindfulness and negative spouse responses suggests that the type or valence of supportive behavior matters. The patient may be more sensitive to emotional support (i.e., the feelings of being understood by his or her partner tapped in perceived partner responsiveness), including negative forms of that support because their feelings are misunderstood by others. It may also be that the negative responses of their spouse are more salient for the patient, who may have their own concerns about being helpless to control their pain, to blame for their pain or frustrated with their pain. In contrast, solicitous responses, which are instrumental support focused on the pain, are perceived as expected acts to which patients are entitled (Cano, Leong, Heller, & Lutz, 2009) or otherwise go unnoticed (Gable, Reis, & Downey, 2003).

Although the main focus of this project was on spouse's mindfulness as a correlate of patient's adjustment, I also investigated patient's mindfulness. As with spouse's mindfulness, patient's mindfulness was related to perceived partner responsiveness. However, patient's mindfulness was not significantly related to patient-rated solicitous or negative spouse responses to patient's pain. These findings may be due to the constructs or types of support assessed in this study. The measure of perceived partner responsiveness taps the positive and emotional component of support or feelings of being understood or known by one's partner. Conversely, the measure of negative spouse responses to patient's pain taps the negative and emotional component of support or the expression of negative emotions by the spouse

to the patient. However, the solicitous spouse responses to pain measure taps the instrumental or tangible components of support (e.g., providing assistance with tasks, getting pain medications). With these differences in mind, it may be that positive emotional support, or the feeling of being understood by one's partner, is more perceptible to the mindful patient as compared to the negative or solicitous support. Perhaps mindful patients are also more able to take the perspective of their spouse and understand and accept their spouse's negative responses to the patient's pain. These associations represent an area where future research could greatly aid in clarifying these findings regarding the type of support behavior.

The patient's mindfulness might not be related to pain-specific support because what determines the spouse's pain-specific support is the spouse's mindfulness, not whether the patient is mindful. Indeed, spouses may act in certain ways independent of the patient's mindfulness. This would indicate that spouse involvement in psychosocial treatment for chronic pain is important as treatment may help spouses be more mindful and less negative toward patients.

Mindfulness and Patient Adjustment

Spouse's mindfulness was also associated with patient's adjustment variables such as patient's reported general psychological distress and marital satisfaction. The benefits of mindfulness in this study appear consistent with the scant existing research suggesting that mindfulness is beneficial to relationship satisfaction within romantic relationships by increasing empathy and decreasing psychological distress (Burpee & Langer, 2005; Dekeyser et al., 2008; Wachs & Cordova, 2007). Further, other research has shown that mindful individuals are more capable of initiating and maintaining

satisfying interpersonal relationships (Follette, Palm, & Pearson, 2006; Germer, Seigel, & Fulton, 2005). Barnes et al. (2007) found that individual mindfulness was related to higher relationship satisfaction, love, commitment and less emotional reactivity to relationship conflict and overall anger or hostility in the relationship. In further support of these results, Carson et al. (2004) implemented a mindfulness-based relationship enhancement intervention which taught both partners to be more mindful of themselves and their relationship and found that couples that received the intervention reported higher relationship satisfaction, relatedness, closeness, and acceptance of partner. However, none of these studies have investigated these links in couples with a chronic stressor such as chronic pain.

Spouse's mindfulness was also associated with patient's general psychological distress, a finding that may be explained by other research indicating that mindful individuals are less emotionally reactive, leading to better relationships and less relationship conflict (Barnes et al., 2007). Less emotional reactivity by one's partner and less relationship conflict may contribute to one being less distressed in general. Indeed, other research has indicated that conflict within a relationship can increase psychological distress in the couple members (Beach & O'Leary, 1993).

Spouse's mindfulness was not associated with patient's pain severity or pain interference. Though there is no prior research that would indicate that these variables should be associated, one might predict that spouse's mindfulness would enable the spouse to regulate their own emotions better and contribute to less patient distress, which may, in turn, contribute to the patient reporting less pain severity or pain interference. In other words, a mindful spouse might interact with the patient in a

validating and caring way, thereby decreasing the patient's distress and related pain severity or pain interference. Yet, this was not the case. Perhaps, spouse's mindfulness has an effect on psychological distress but not on physical health parameters. Alternatively, mindful behaviors may affect pain and interference over the long-term. Further research is needed to bear this out.

Also of interest is that patient's mindfulness was related to patient's marital satisfaction and general psychological distress, but not related to patient-reported pain severity or pain interference. Similar to spouse's mindfulness, mindful patients may be less emotionally reactive, lending to better emotion regulation, less conflict in relationships and more stable relationships. As such, based on previous research, one would expect that a mindful patient would report more marital satisfaction and less general psychological distress (Barnes et al., 2007; Burpee & Langer, 2005; Dekeyser et al., 2008; Wachs & Cordova, 2007). However, the "unmindful" model of pain suggested by McCracken et al. (2007) would have predicted less pain severity and interference in more mindful patients. According to McCracken et al. (2007), chronic pain leads to a preoccupation with pain, negative thinking about patients' situation, engaging in emotional suffering as a result of their thoughts and feelings and becoming stuck in a repeating pattern of unsuccessfully struggling with their pain (i.e., being "unmindful"), thereby limiting functioning or allowing pain to interfere in functioning. Mindful patients would be expected to be better able to pull themselves out of this pain rumination loop, so the lack of associations between pain severity or pain interference and mindfulness in this study is not consistent with McCracken et al.'s hypothesis. As

discussed below, I also examined the relative contributions of each spouses' mindfulness in exploratory analyses.

Spouse's Support Behaviors and Patient's Adjustment

Spouse's empathic concern and patient's marital satisfaction were positively associated. This result would be predicted from previous research linking spouse's empathy with his or her partner's marital satisfaction (Busby & Gardner, 2008). Empathic concern has been associated with measures of selflessness and concern for others (Davis, 1981) and one would predict that these characteristics would act to enhance interpersonal relationships, such as marriage. Further, empathic concern has been related to helping behavior which may also enhance marital satisfaction.

Patient-rated perceived partner responsiveness was significantly related to patient's marital satisfaction and general psychological distress. There is some evidence suggesting that perceived partner responsiveness is associated with marital satisfaction, as the measure itself assesses the feeling of being "known" or understood by his or her partner (Reis, Clark & Holmes, 2004). Indeed, perceived partner responsiveness was found to mediate the association between self-disclosure and partner disclosure, both components of marital satisfaction (Laurenceau, Barrett & Rovine, 2005). It may also be through being understood and self-disclosure that perceived partner responsiveness is associated with the patient's general psychological distress. Perhaps perceiving one's partner as responsive to his or her affective needs and feeling understood leads to less psychological distress. However, further research is needed to parse out the possible mediators in these associations.

Negative spouse responses to patient's pain was significantly related to patient's marital satisfaction and general psychological distress. Previous research with couples with chronic pain has also found these associations (Cano, Weisberg, & Gallagher, 2000). Cano et al. proposed that negative spouse responses to the patient's pain may be interpreted by the patient as an indicator of the spouse's frustration or anger with the patient. This interpretation may then affect marital satisfaction and, through marital satisfaction, patient's psychological distress. It has also been shown that negative spouse responses are associated with greater depressive symptoms in patients, thus contributing to greater psychological distress (Kerns, Haythornthwaite, Southwick, & Giller, 1990; Pence et al., 2008)

Patient-rated solicitous spouse responses to patient's pain was significantly correlated to patient's marital satisfaction and patient's pain interference. The association between solicitous spouse responses and patient's marital satisfaction is consistent with previous research (Kerns, Haythornthwaite, Southwick, & Giller, 1990). It may be that the helpful, solicitous responses of the spouse are perceived by the patient as caring and well-meaning, thereby positively influencing marital satisfaction. As well, the associations between solicitous spouse responses and patient's pain interference is congruent with previous research demonstrating higher levels of patient-reported pain behavior, pain intensity and pain interference with solicitous spouse responses to the patient's pain (Pence et al., 2008; Romano et al., 2000) . These associations can be accounted for by the operant and cognitive-behavioral models of pain in that the solicitous spouse behaviors act to reinforce the patient's pain behaviors, leading to

decreases in the patient's activity and increases in the patient's perceptions of pain (Pence et al., 2008; Romano, Turner, & Jenson, 1997; Romano et al., 2000)

Spouse's Support Behaviors as Mediators

The current findings show that the extent to which patients reported that their spouses were more emotionally responsive and less negatively reactive to them when they were in pain explained the positive associations between spouse's mindfulness and patient's marital satisfaction.

Perceived partner responsiveness explained the positive association between spouse's mindfulness and patient's marital satisfaction. These results support previous findings of an association between mindfulness and marital satisfaction (Wachs & Cordova, 2007; Dekeyser et al., 2008). It is possible that mindfulness enables the spouse to behave in a way that conveys his or her understanding to the patient, which the patient then perceives as validating and caring. This behavioral factor may be the perceived responsiveness of the spouse to the patient. Partner responsiveness has been implicated in relationship satisfaction in prior research (Reis, Clark, & Holmes, 2004). It may be that mindfulness may increase the spouse's ability to understand and validate the patient's thoughts and feelings. This validation by the spouse may increase the patient's perception of responsiveness in his or her spouse, thereby increasing his or her satisfaction in the relationship. Other research on perceived partner responsiveness has shown that perceived responsiveness partially mediated the association between self-disclosure and intimacy, with intimacy being related to marital satisfaction (Laurenceau, Barrett, & Rovine, 2005). As such, it may be that the spouse's

mindfulness, through increases in intimacy due to perceived partner responsiveness, increases the patient's marital satisfaction.

Negative spouse responses to patient's pain also explained the association between spouse's mindfulness and patient's marital satisfaction. This finding is consistent with previous research that demonstrated that spouse's mindfulness is associated with decreased emotional reactivity on the part of the spouse (Barnes et al., 2007). This decreased reactivity may enable the spouse to act less negatively towards the patient when the patient is in pain. Rather than react with anger, frustration, or irritation, spouses may be able to react in a more neutral or validating way toward the patient when the patient is in pain. The decrease in negative spouse responses toward the patient may lead to the patient feeling more understood by their spouse, thereby increasing the patient's marital satisfaction.

Interestingly, solicitous spouse responses to patient's pain were not related to spouse's mindfulness, though it was positively associated with patient's marital satisfaction. It appears that spouse's mindfulness only correlates with the negative, but not the positive or helpful instrumental support responses towards the patient when they are in pain. It may be that the negative responses to patient's pain are more memorable and/or hurtful for the patient and his or her marital satisfaction and spouse's mindfulness enables the spouse to decrease or inhibit these responses. Conversely, as mentioned previously, solicitous spouse responses may be expected or go unnoticed by the patient on a conscious level, not being attributed to the spouse, though still contributing to the patient's marital satisfaction.

Contributions of Spouse and Patient Mindfulness

The current study demonstrated that both patient's and spouse's mindfulness contributed to spouse's support behavior (i.e., perceived partner responsiveness) and to patient's adjustment (i.e., patient's marital satisfaction and general psychological distress). However, further analyses revealed that spouse's mindfulness was responsible for these contributions, above the contributions made by patient's mindfulness. This would appear to indicate that, though patient's mindfulness does contribute some to the patient-perceived spouse's support behaviors and patient's adjustment, as the individual mindfulness models would predict (Baer, 2003; Brown & Ryan, 2003), spouse's mindfulness appears to have greater influence on the perceptions of support and marital satisfaction of the patient, but not the patient's general psychological distress. Given that a majority of couples' research has found that one's own effects, rather than one's partner's, are related to one's own outcomes, one would not expect that spouse's mindfulness would be as strongly related to patient-reported variables (i.e., perceived partner responsiveness, negative spouse responses, marital satisfaction and general psychological distress) as found here. Future research and perhaps the use of a different statistical analysis may be able to clarify the spouse's and patient's mindfulness contributions and interactions further.

A test of the potential interaction of spouse's and patient's mindfulness was conducted and did not yield any significant results. This is interesting, as one would expect that the spouse's mindfulness would interact with the patient's mindfulness, such that the patient would have the best adjustment when both partners were high scorers on mindfulness. Further, one may expect, in this sample, that if the spouse was high in

mindfulness, but the patient was low in mindfulness, there would be little benefit to the patient's adjustment. However, this does not appear to be the case. This may be due to lack of statistical power to test a small effect size, which interactions typically are. Another interesting observation is that the correlation between spouse's mindfulness and patient's mindfulness in this study was not significant, although it was in the expected direction. Further research on the interplay between partners' mindfulness is needed because there is currently no research on how partners contribute to each other's mindfulness or how partners' skills interact to predict other indicators of adjustment.

Limitations and Future Directions

Because this is one of the first studies to examine the associations of spouse's mindfulness on spouse's support behaviors and patient's adjustment in chronic pain couples, and the first to assess mediation of these associations by spouse's support behaviors, the results should be viewed as preliminary. A great deal of work remains to be done to explore the implications of individual mindfulness on both other people and on relationships. As is typical in most studies of its kind, this study relied on self-report measures that rest on the assumption that the individual is an accurate reporter of his or her own and other's behavior. Further, the measure of mindfulness, the Five-Facets of Mindfulness Questionnaire (FFMQ; Baer et al., 2006), is a newer measure and not yet used as frequently as other measures in the mindfulness literature. This fact makes comparison of this study to prior research on mindfulness difficult as the constructs contained in the FFMQ are more distinct and consistent with the more sophisticated and theoretically defined conceptualizations of mindfulness (i.e., observe, describe, acting

with awareness, non-reactive, non-judging), compared with other measures that examine the constructs of attention and awareness within mindfulness.

As this study is based on data collected from the fourth wave of a longitudinal study and it included less than half of the original participants, there may be some self-selection bias in the participants. Indeed, those who completed the fourth wave, compared to those who completed the first wave, were older, married longer and less distressed. These factors may influence the results of this study in that the results may be more an artifact of age or familiarity with one's partner or lesser psychological distress. This may be particularly true, given what is suspected about marital research, that individuals who are unhappy in their relationships are less likely to volunteer for or continue in relationship studies, and therefore it is unknown what the effect of mindfulness might have in more unhappy couples. Another limitation is the cross-sectional nature of this study and the inability to compare many of the variables across the previous time points in the longitudinal study. As such, it is difficult to determine the direction of many of the associations and models tested in this study.

Future research should address if there are particular aspects of mindfulness that are related to the associations found in this study. For example, Wachs and Cordova (2007) suggest that mindfulness may affect one's tolerance and acceptance of another. It is possible that there are factors that further explain or mediate the associations between mindfulness and marital satisfaction or general psychological distress, such as acceptance and tolerance of one's partner. I would hypothesize that mindfulness would positively affect one's tolerance and acceptance of another, which, in turn, would positively impact marital satisfaction and general psychological distress. Coding of

interaction behaviors during a discussion for validation or invalidation, or other acceptance behaviors, would likely also yield results in support of this hypothesis. Another line of research may involve further refining the measures to include observational and self-report measures of marital interactions during a particular task (e.g., perceived and observed partner responsiveness) while measuring pre and post mindfulness and marital satisfaction to determine whether the type of support (i.e., emotional, informational, instrumental etc.) or the actual or perceived supportive exchanges are at the root of these associations. It may also be possible in this type of study to determine whether different types of support or actual or perceived support differ in their associations with mindfulness or marital satisfaction, as postulated by recent models of social support (Maisel & Gabel, 2009). This type of study could also address the limitation of the self-report data. This may elucidate any differences between perceived compared to actual support behaviors, thereby clarifying whether individual mindfulness translates into behavior or if mindfulness conveys a message of being responsive to the patient. It may also clarify whether individual mindfulness is expressed by a particular type of support behavior toward the patient (e.g., emotional, informational, instrumental etc...).

Finally, parallel measures of the associated variables (i.e., mindfulness, empathy, psychological distress and marital satisfaction) would enable an actor-partner interaction model to be examined. This may allow for better explanation of the effects of one's mindfulness on one's partner's mindfulness, as well as how this actor-partner effect impacts each person's marital satisfaction or psychological distress. Though interaction models including spouse and patient mindfulness in the current study did not

yield significant results, a study that measured both partner's mindfulness and empathy, marital satisfaction or general distress prior to and following an intervention designed to increase mindfulness may show that both partners' mindfulness skills interact in predicting healthy adjustment.

Clinical Implications

Nevertheless, the current study has implications for clinical work with couples with chronic pain and other illnesses by identifying areas in which clinical interventions may be most effective. In particular, increasing individual mindfulness within the couple through mindfulness training may increase one's ability to respond to his or her partner in a way that maintains or increases relationship satisfaction, thereby influencing other patient variables. Indeed, this type of intervention, mindfulness-based relationship enhancement (Carson et al., 2004), has been employed with healthy couples to maintain or improve relationship functioning. Perhaps, given the ability of pain to interfere with individual mindfulness, as proposed by McCracken et al. (2007), mindfulness-based interventions directed at the individual with pain, or at the couple with pain, would also prove to be beneficial. Further, the results seem to highlight the importance of including the spouse in interventions directed at improving the quality of life for individuals with chronic pain as the spouse's reactions to the patient affect the patient's adjustment.

Conclusions

The current study demonstrated the associations between spouse's mindfulness, patient-rated spouse's support behaviors and patient's marital satisfaction, as well as the explanatory value of intervening support variables. It also demonstrated, through

exploratory analysis, that spouse's mindfulness contributed to these associations above what patient's mindfulness contributes. Finally, despite its limitations, the current study is the first to investigate these associations and mediation models. The results of the current study can be applied to future research with couples with chronic pain and to the development of interventions intended to improve the quality of relationships among couples with chronic pain.

Table 1**Correlations Between Mindfulness and Spouse's Support Variables**

	SMF	PMF	EC	PT	PPR	SSRP	NSRP
SMF	--						
PMF	.22	--					
EC	.20	.15	--				
PT	.28*	.07	.74**	--			
PPR	.38*	.30*	.33*	.30*	--		
SSRP	.18	-.20	.17	.10	.54**	--	
NSRP	-.39*	-.05	-.08	-.13	-.63**	-.34*	--

Note. N = 51.

SMF = Spouse mindfulness, PMF = Patient mindfulness, EC = Spouse empathic concern, PT = Spouse perspective taking, PPR = perceived partner responsiveness (rated by patients regarding spouses' partner responsiveness), SSRP = patient-rated solicitous spouse response to patient pain, NSRP = patient-rated negative spouse response to patient pain

*p < .05, **p < .01

Table 2**Correlations Between Mindfulness and Patient's Adjustment Variables**

	SMF	PMF	DAS	GD	Sev	Interf
SMF	--					
PMF	.22	--				
DAS	.45**	.32*	--			
GD	-.30*	-.43**	-.33*	--		
Sev	.00	-.13	-.02	.36**	--	
Interf	-.15	-.14	-.14	.54**	.69**	--

Note. N = 51.

SMF = Spouse mindfulness, PMF = Patient mindfulness, DAS = Patient marital satisfaction, GD = Patient general psychological distress, Sev = Patient pain severity, Interf = Patient pain interference.

*p < .05, **p < .01

Table 3**Correlations Between Spouse's Support and Patient's Adjustment Variables**

	EC	PT	PPR	SSRP	NRSP	DAS	GD	Sev	Interf
EC	--								
PT	.74**	--							
PPR	.33*	.30*	--						
SSRP	.17	.10	.54**	--					
NRSP	-.08	-.13	-.63**	-.56**	--				
DAS	.32*	.21	.76**	.42**	-.56**	--			
GD	-.18	-.09	-.31*	.11	.40**	-.33*	--		
Sev	-.14	.08	.05	.17	.21	-.02	.36**	--	
Interf	-.24	-.12	-.02	.39**	.20	-.14	.54**	.69**	--

Note. N = 51.

EC = Spouse empathic concern, PT = Spouse perspective taking, PPR = patient perceived partner responsiveness, SSRP = patient-rated solicitous spouse response to patient pain, NRSP = patient-rated negative spouse response to patient pain, DAS = Patient marital satisfaction, GD = Patient general psychological distress, Sev = Patient pain severity, Interf = Patient pain interference.

*p < .05, **p < .01

Table 4

Perceived Partner Responsiveness as a Mediator of the Association Between Patient's Mindfulness and Patient's Marital Satisfaction (N = 51)

Variable	<i>B</i>	<i>SE B</i>	β
Step 1			
Patient Mindfulness	.31	.13	.32*
Step 2			
Patient Mindfulness	.09	.09	.09
Perceived Partner Responsiveness	.34	.04	.74***

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 5

Perceived Partner Responsiveness as a Mediator of the Association Between Spouse's Mindfulness and Patient's Marital Satisfaction (N = 51)

Variable	<i>B</i>	<i>SE B</i>	β
Step 1			
Spouse Mindfulness	.50	.14	.45***
Step 2			
Spouse Mindfulness	.21	.11	.19
Perceived Partner Responsiveness	.32	.04	.69***

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 6

Perceived Partner Responsiveness as a Mediator of the Association Between Patient's and Spouse's Mindfulness and Patient's Marital Satisfaction (N = 51)

Variable	<i>B</i>	<i>SE B</i>	β
Step 1			
Spouse Mindfulness	.45	.14	.40**
Patient Mindfulness	.23	.13	.08
Step 2			
Spouse Mindfulness	.20	.11	.18
Patient Mindfulness	.07	.09	.07
Perceived Partner Responsiveness	.31	.05	.67***

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 7

Perceived Partner Responsiveness as a Mediator of the Association Between Spouse's Mindfulness and Patient's General Psychological Distress (N = 51)

Variable	<i>B</i>	<i>SE B</i>	β
Step 1			
Spouse Mindfulness	-.47	.21	-.30*
Step 2			
Spouse Mindfulness	-.33	.23	-.21
Perceived Partner Responsiveness	-.15	.09	-.23

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 8**Negative Spouse Responses as a Mediator of the Association Between Spouse's Mindfulness and Patient's Marital Satisfaction (N = 51)**

Variable	<i>B</i>	<i>SE B</i>	β
Step 1			
Spouse Mindfulness	.50	.14	.45***
Step 2			
Spouse Mindfulness	.30	.14	.27*
Negative Spouse Responses	-1.50	.41	-.45***

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 9

Negative Spouse Responses as a Mediator of the Association Between Spouse's Mindfulness and Patient's General Psychological Distress (N = 51)

Variable	<i>B</i>	<i>SE B</i>	β
Step 1			
Spouse Mindfulness	-.47	.21	-.30*
Step 2			
Spouse Mindfulness	-.26	.22	-.17
Negative Spouse Responses	1.56	.65	.34*

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 10**Spouse's Mindfulness as a Mediator of the Association Between Patient's Mindfulness and Perceived Partner Responsiveness (N = 51)**

Variable	<i>B</i>	<i>SE B</i>	β
Step 1			
Patient Mindfulness	.65	.29	.30*
Step 2			
Patient Mindfulness	.50	.28	.23
Spouse Mindfulness	.80	.32	.33*

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 11

Spouse's Mindfulness as a Mediator of the Association Between Patient's Mindfulness and Patient's General Psychological Distress (N = 51)

Variable	<i>B</i>	<i>SE B</i>	β
Step 1			
Patient Mindfulness	-.59	.18	-.43***
Step 2			
Patient Mindfulness	-.53	.18	-.39**
Spouse Mindfulness	-.34	.20	-.22
*p < .05, **p < .01, ***p < .001			

Table 12**Spouse's Mindfulness as a Mediator of the Association Between Patient's Mindfulness and Patient's Marital Satisfaction (N = 51)**

Variable	<i>B</i>	<i>SE B</i>	β
Step 1			
Patient Mindfulness	.31	.13	.32*
Step 2			
Patient Mindfulness	.23	.13	.23
Spouse Mindfulness	.45	.14	.40**

* $p < .05$, ** $p < .01$, *** $p < .001$

Figure 1**Mediation model**

Appendix A
Five Facet Mindfulness Questionnaire (FFMQ)

Please answer the following items as they BEST describe you.

	Never or Very Rarely True	Sometimes True	Neutral	Mostly True	Very Often or Always True
I perceive my feelings and emotions without having to react to them.	1	2	3	4	5
When I am walking, I deliberately notice the sensations of my body moving.	1	2	3	4	5
I find it difficult to stay focused on what's happening in the present.	5	4	3	2	1
I'm good at finding the words to describe my feelings.	1	2	3	4	5
I criticize myself for having irrational thoughts or inappropriate emotions.	5	4	3	2	1
I watch my feelings without getting lost in them.	1	2	3	4	5
When I take a shower or bath, I stay alert to the sensations of water on my body.	1	2	3	4	5
It seems that I am "running on automatic" without much awareness of what I'm doing.	5	4	3	2	1
I can easily put my beliefs, opinions, and expectations into words.	1	2	3	4	5
I tell myself I shouldn't be feeling the way I'm feeling.	5	4	3	2	1
In difficult situations, I can pause without immediately reacting.	1	2	3	4	5
I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.	1	2	3	4	5
I rush through activities without being really attentive to them.	5	4	3	2	1
It's hard for me to find the words to describe what I'm thinking.	5	4	3	2	1

FFMQ

	Never or Very Rarely True	Sometimes True	Neutral	Mostly True	Very Often or Always True
I believe some of my thoughts are abnormal or bad and I shouldn't think that way.	5	4	3	2	1
When I have distressing thoughts or images, I am able to just notice them without reacting.	1	2	3	4	5
I pay attention to sensations, such as the wind in my hair or the sun on my face.	1	2	3	4	5
I do jobs or tasks automatically, without being aware of what I'm doing.	5	4	3	2	1
I have trouble thinking of the right words to express how I feel about things.	5	4	3	2	1
I make judgments about whether or not my thoughts are good or bad.	5	4	3	2	1
When I have distressing thoughts or images, I feel calm soon after.	1	2	3	4	5
I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.	1	2	3	4	5
I find myself doing things without paying attention.	5	4	3	2	1
When I have a sensation in my body, it's hard for me to describe it because I can't find the right words.	5	4	3	2	1
I tell myself I shouldn't be thinking what I'm thinking.	5	4	3	2	1
When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting overtaken by it.	1	2	3	4	5
I notice the smells and aromas of things.	1	2	3	4	5
When I do things, my mind wanders off and I am easily distracted.	5	4	3	2	1
Even when I am feeling terribly upset, I can find a way to put it into words.	1	2	3	4	5

Appendix B

Interpersonal Reactivity Index (IRI)

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by filling in the appropriate bubble. Read each item carefully before responding. Answer as honestly as you can.

	Does not describe me well				Describes me very well
I often have tender, concerned feelings for people less fortunate than me.	0	1	2	3	4
I sometimes find it difficult to see things from the "other guy's" point of view.	4	3	2	1	0
Sometimes I don't feel sorry for other people when they are having problems.	4	3	2	1	0
I try to look at everybody's side of a disagreement before I make a decision.	0	1	2	3	4
When I see someone being taken advantage of, I feel kind of protective towards them.	0	1	2	3	4
I sometimes try to understand my friends better by imagining how things look from their perspective.	0	1	2	3	4
Other people's misfortunes do not usually disturb me a great deal.	4	3	2	1	0
If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.	4	3	2	1	0
When I see someone being treated unfairly, I sometimes don't feel much pity for them	4	3	2	1	0
I am often quite touched by things I see happen.	0	1	2	3	4
I believe that there are two sides to every question and try to look at them both.	0	1	2	3	4
I would describe myself as a pretty soft-hearted person.	0	1	2	3	4
When I'm upset at someone, I usually try to "put myself in his shoes" for a while.	0	1	2	3	4
Before criticizing somebody, I try to imagine how I would feel if I were in their place.	0	1	2	3	4

Appendix C
Perceived Partner Responsiveness (PPR)

Please answer the following questions about your current romantic partner. My partner usually:

	Not at all true		Somewhat true		Moderately true		Very true		Completely true
Is an excellent judge of my character	1	2	3	4	5	6	7	8	9
Sees the “real” me	1	2	3	4	5	6	7	8	9
Sees the same virtues and faults in me as I see in myself	1	2	3	4	5	6	7	8	9
“gets the facts right” about me	1	2	3	4	5	6	7	8	9
Esteems me, shortcomings and all	1	2	3	4	5	6	7	8	9
Knows me well	1	2	3	4	5	6	7	8	9
Values and respects the whole package that is the “real” me	1	2	3	4	5	6	7	8	9
Usually seems to focus on the “best side” of me	1	2	3	4	5	6	7	8	9
Is aware of what I am thinking and feeling	1	2	3	4	5	6	7	8	9
Understands me	1	2	3	4	5	6	7	8	9
Really listens to me	1	2	3	4	5	6	7	8	9
Expresses liking and encouragement for me	1	2	3	4	5	6	7	8	9
Seems interested in doing things with me	1	2	3	4	5	6	7	8	9
Values my abilities and opinions	1	2	3	4	5	6	7	8	9
Respects me	1	2	3	4	5	6	7	8	9
Is responsive to my needs	1	2	3	4	5	6	7	8	9

Appendix D
West Haven-Yale Multidimensional Pain Inventory (MPI)
Negative and Solicitous Spouse Response Scales

In this section, we are interested in knowing how your current romantic partner responds to you when he/she knows you are in pain. On the scale next to each question, circle to indicate how often your romantic partner responds to you in that particular way when he/she knows that you are in pain. Please answer all of the remaining questions.

	Never						Very Often
Ignore you	0	1	2	3	4	5	6
Ask you what he or she can do to help	0	1	2	3	4	5	6
Read to you	0	1	2	3	4	5	6
Express irritation at you	0	1	2	3	4	5	6
Take over your jobs or duties	0	1	2	3	4	5	6
Talk to you about something else to take your mind off the pain	0	1	2	3	4	5	6
Express frustration at you	0	1	2	3	4	5	6
Try to get you to rest	0	1	2	3	4	5	6
Try to involve you in some activity	0	1	2	3	4	5	6
Express anger at you	0	1	2	3	4	5	6
Get you some pain medications	0	1	2	3	4	5	6
Encourage you to work on a hobby	0	1	2	3	4	5	6
Get you something to eat	0	1	2	3	4	5	6
Turn on the T.V. to take your mind off the pain	0	1	2	3	4	5	6
Worried a lot about things	0	1	2	3	4	5	6
Got tired or fatigued easily	0	1	2	3	4	5	6

Appendix E
West Haven-Yale Multidimensional Pain Inventory (MPI)
Pain Interference Scales

In the following questions you will be asked to describe how your pain affects your life. Beside each question is a scale to record your answer. Read each question carefully and then circle on the scale next to that question to indicate how that specific question applies to you.

	No interference or change						Extreme interference or change
In general, how much does your pain problem interfere with your day to day activities?	0	1	2	3	4	5	6
Since the time you developed a pain problem, how much has your pain changed your ability to work?	0	1	2	3	4	5	6
How much has your pain changed the amount of satisfaction or enjoyment you get from participating in social and recreational activities?	0	1	2	3	4	5	6
How much has your pain changed your ability to participate in recreational or other social activities?	0	1	2	3	4	5	6
How much has your pain changed the amount of satisfaction you get from family-related activities?	0	1	2	3	4	5	6
How much has your pain changed your marriage or romantic relationship, and other family relationships?	0	1	2	3	4	5	6
How much has your pain changed your ability to do household chores?	0	1	2	3	4	5	6
How much has your pain changed your friendships with people other than your family?	0	1	2	3	4	5	6

Appendix F
Brief Pain Inventory (BPI)

Please rate your pain by choosing the one number that best describes your pain on the AVERAGE:

0	1	2	3	4	5	6	7	8	9	10
No Pain										Pain as bad as you can imagine

Please rate you pain by choosing the one number that best describes how much pain you have RIGHT NOW:

0	1	2	3	4	5	6	7	8	9	10
No Pain										Pain as bad as you can imagine

Appendix G
Dyadic Adjustment Scale (DAS)

Most people have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and your partner for each item on the following list by circling the appropriate response

	Always Agree	Almost Always Agree	Occasionally Disagree	Frequently Disagree	Almost Always Disagree	Always Disagree
Handling family finances	5	4	3	2	1	0
Matters of recreation	5	4	3	2	1	0
Religious matters	5	4	3	2	1	0
Demonstrations of affection	5	4	3	2	1	0
Friends	5	4	3	2	1	0
Sexual relations	5	4	3	2	1	0
Conventionality (correct or proper behavior)	5	4	3	2	1	0
Philosophy of life	5	4	3	2	1	0
Ways of dealing with parents or in-laws	5	4	3	2	1	0
Aims, goals, and things believed important	5	4	3	2	1	0
Amount of time spent together	5	4	3	2	1	0
Making major decisions	5	4	3	2	1	0
Household tasks	5	4	3	2	1	0
Leisure time interests and activities	5	4	3	2	1	0
Career decisions	5	4	3	2	1	0

	Every day	Almost every day	Occasionally	Rarely	Never
Do you kiss your mate?	4	3	2	1	0

	All of them	Most of them	Some of them	Very few of them	None of them
Do you and your mate engage in outside interests together?	4	3	2	1	0

DAS

	All of the time	Most of the time	More often than not	Occasionally	Rarely	Never
How often do you discuss or have you considered divorce, separation, or terminating your relationship?	0	1	2	3	4	5
How often do you or your mate leave the house after a fight?	0	1	2	3	4	5
In general, how often do you think that things between you and your partner are going well?	5	4	3	2	1	0
Do you confide in your mate?	5	4	3	2	1	0
Do you ever regret that you married or lived together?	0	1	2	3	4	5
How often do you and your mate quarrel?	0	1	2	3	4	5
How often you and your mate "get on each other's nerves"?	0	1	2	3	4	5

	Never	Less than once per month	Once or twice a month	Once or twice a week	Once a day	More often
How often do you say the following events occur between you and your mate?						
Have a stimulating exchange of ideas	0	1	2	3	4	5
Laugh together	0	1	2	3	4	5
Calmly discuss something	0	1	2	3	4	5
Work together on a project	0	1	2	3	4	5

These are some things about which couples agree and sometimes disagree. Indicate if either item below caused differences of opinions or were problems in your relationship during the past few weeks.

Being too tired for sex Yes No Not showing love Yes No

DAS

Which of the following statements best describes how you feel about the future of your relationship? (Choose one)

- I want desperately for my relationship to succeed, and would go to almost any length to see that it does.
- I want very much for my relationship to succeed, and will do all I can to see that it does.
- I want very much for my relationship to succeed, and will do my fair share to see that it does.
- It would be nice for my relationship to succeed, but I can't do much more than I'm doing now.
- It would be nice if it succeeded, but I refuse to do anymore than I am doing now to keep the relationship going.
- My relationship can never succeed, and there is no more that I can do to keep the relationship going.

The statements below represent different degrees of happiness in your relationship. The middle point (happy), represents the degree of happiness in most relationships. Choose the statement which best describes the degree of happiness, all things considered, of your relationship.

Extremely Happy	Fairly Happy	A Little Happy	Happy	Very Happy	Extremely Happy	Perfectly Happy
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Appendix H

Mood and Anxiety Symptom Questionnaire (MASQ)

Below is a list of feelings, sensations, problems, and experiences that people sometimes have. Read each item and then mark the appropriate space next to that item. Use the choice that best describes how much you have felt or experienced things this way during the past week, including today. Use this scale when answering.

	Not at all	A little bit	Moderately	Quite a bit	Extremely
Felt afraid	1	2	3	4	5
Felt confused	1	2	3	4	5
Slept very well	1	2	3	4	5
Felt sad	1	2	3	4	5
Felt discouraged	1	2	3	4	5
Felt nauseous	1	2	3	4	5
Felt like crying	1	2	3	4	5
Had diarrhea	1	2	3	4	5
Felt worthless	1	2	3	4	5
Felt nervous	1	2	3	4	5
Felt depressed	1	2	3	4	5
Felt irritable	1	2	3	4	5
Felt uneasy	1	2	3	4	5
Felt hopeless	1	2	3	4	5
Blamed myself for a lot of things	1	2	3	4	5
Felt dissatisfied with everything	1	2	3	4	5
Had trouble remembering things	1	2	3	4	5
Felt like something awful was going to happen	1	2	3	4	5
Did not have much of an appetite	1	2	3	4	5
Felt pessimistic about the future	1	2	3	4	5
Felt like a failure	1	2	3	4	5
Felt very restless	1	2	3	4	5
Had trouble falling asleep	1	2	3	4	5
Felt sluggish or tired	1	2	3	4	5
Was unable to relax	1	2	3	4	5
Had an upset stomach	1	2	3	4	5
Had a lump in my throat	1	2	3	4	5
Had trouble making decisions	1	2	3	4	5
Was disappointed in myself	1	2	3	4	5
Had trouble concentrating	1	2	3	4	5
Felt tense or "high-strung"	1	2	3	4	5
Had trouble paying attention	1	2	3	4	5
Muscles were tense or sore	1	2	3	4	5
Felt keyed up, "on edge"	1	2	3	4	5
Had trouble staying asleep	1	2	3	4	5
Worried a lot about things	1	2	3	4	5
Got tired or fatigued easily	1	2	3	4	5

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ABSTRACT**MINDFULNESS AND RELATIONSHIP HEALTH IN COUPLES WITH CHRONIC PAIN**

by

AMY WILLIAMS

May 2010

Advisor: Dr. Annmarie Cano**Major:** Clinical Psychology**Degree:** Master of Arts

Chronic pain is an important public health problem that is associated with a host of negative individual and relationship outcomes. The purpose of this study was to identify mindfulness, empathy and perceived support in marital relationships, all characteristics of a healthy marital relationship, as important correlates of mental health, relationship health, and health-related quality of life in couples with chronic pain. Participants were contacted as the fourth phase of a longitudinal study on couples with chronic pain in the Metro Detroit Area. Both the patient and spouse individually completed questionnaires pertaining to their marriage, mood, pain and personality. The sample was diverse for both patients (52.1% Caucasian), and spouses (59.2% Caucasian). The gender of the patients was balanced with 52.9% male ($n = 27$). The average ages of patients and spouses were 58.16 years and 58.35 years, respectively. Patients reported an average pain duration of 14.04 years. Spouse's and patient's mindfulness was associated with a variety of spouse's support behaviors, such as perceived partner responsiveness and negative spouse responses to patient's pain, and patient's psychological and marital health measures. Further, spouse's support

behaviors such as perceived partner responsiveness and negative spouse responses to the patient's pain mediated the associations between spouse's mindfulness and patient's marital satisfaction. Because chronic pain is an issue that influences many aspects of intrapersonal and interpersonal factors, increasing both patient and spouse mindfulness may be a beneficial intervention in maintaining quality of life for individuals with chronic pain and their spouses.

AUTOBIOGRAPHICAL STATEMENT

Amy Margaret Williams received a Bachelor of Science degree in 2001 from the University of Guelph in Guelph, Ontario where she majored in Reproductive Biology and minored in Psychology. She has also received a Bachelor of Arts degree in 2007 from Simon Fraser University in Burnaby, British Columbia where she majored in Psychology and minored in Counseling. She is currently in the Clinical Psychology Doctoral Program at Wayne State University, specializing in Health Psychology. Her primary interests are how physical conditions, especially chronic pain and infertility, influence mental health and interpersonal relationships. She enjoys traveling, spending time outdoors and spending time with her partner, Ted, her dog, Dusty, her family and friends.