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Evaluating Outcomes And Response Profiles Of A Psychological Treatment For People With Chronic Pain

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EVALUATING OUTCOMES AND RESPONSE PROFILES OF A PSYCHOLOGICAL TREATMENT FOR PEOPLE WITH CHRONIC PAIN

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CHAPTER 1

INTRODUCTION

Chronic pain is a leading cause of suffering, disability, and high health care costs. Patients with chronic pain have elevated health care utilization at primary care settings, tertiary care settings, and emergency departments. Furthermore, those patients with greater pain-related disability use even more health care services (Blyth, March, Brnabic, & Cousins, 2004). Becker et al. (1997) found that chronic pain patients are five times more likely to use health care services than those without chronic pain. One study examined the economic impact of chronic non-cancer pain in the workplace and found that each employer lost an average of $2.1 million per year because of absences, medical, and pharmacy costs (Pizzi et al., 2005).

Although many patients with chronic pain report taking a variety of medications, traditional medical interventions often provide limited benefit. Consequently, there has been growing interest in the development and testing of psychological interventions for people with chronic pain (Gatchel et al., 2007). Interventions that teach people to manage their pain using cognitive and behavioral techniques have the most empirical support (Compas, Haaga, Keefe, Leitenberg, & Williams, 1998). For example, pain coping skills training is a comprehensive, empirically-supported program that includes progressive muscle relaxation, distraction, applied relaxation, increasing pleasant activities, problem-solving, activity-rest cycling, and cognitive restructuring (Keefe, Caldwell, Williams, & Gil, 1990). Morley, Eccleston, and Williams (1999) determined that compared with wait-list controls, cognitive-behavioral therapy (CBT) led to better outcomes on all dimensions measured, with a median effect size of 0.50. There is also

evidence that suggests that cognitive-behavioral treatments work for a range of pain disorders. One study compared patients with fibromyalgia and chronic low back pain in a cognitive behavioral treatment and found that both patient groups reported a significant improvement in self-efficacy, pain, distress, disability, and depression symptoms (Wells-Federman, Arnstein, & Caudill-Slosberg, 2003).

Not all of the studies examining cognitive-behavioral techniques have found such positive results, however. A review of an array of psychosocial interventions, but primarily cognitive behavioral approaches, for patients with arthritis found a much lower effect size of 0.18 in favor of psychological interventions (Dixon, Keefe, Scipio, Perri, & Abernathy, 2007). Also, when comparing cognitive-behavioral treatment with a wait list control, Basler and Rehfisch (1990) found improvements on pain immediately following treatment, yet at 6-month follow-up, effects were no longer significant. Furthermore, it appears that only a subset of patients actually improves (Dixon, Keefe, Scipio, Perri, & Abernethy, 2007). The Basler and Rehfisch (1990) study found that the only patients with improved pain at the 6-month follow-up were those participants who were most adherent to the treatment. Upon studying the effects of various CBT and/or exercise interventions for patients with fibromyalgia, Turk (2004) concluded that only about one-third of patients benefit from the treatment.

Even though cognitive-behavioral treatments are the standard treatment for chronic pain, the overall effects are variable and often limited. One possible explanation is that there are different types of pain disorders. Chronic pain can be a symptom of a specific disease in the peripheral tissues (e.g. rheumatoid arthritis, inflammatory bowel disease, multiple sclerosis, cancer), and such patients need to learn to cope with this

disease, its medical treatment, and their symptoms. Improvement through psychological interventions may be limited, and cure is not likely. There are, however, many examples of chronic pain that lack clear, identifiable peripheral causes. Patients with these types of chronic pain have been labeled as having functional disorders, medically unexplained symptoms, somatoform disorders, somatization, and so on, and include diagnoses such as myofascial pain, fibromyalgia (FM), irritable bowel syndrome (IBS), chronic low back pain (CLBP), temporomandibular disorder (TMD), migraine headache, tension-type headache. Such patients likely have different treatment needs than those whose pain is largely peripheral in origin. Also, there are similarities across these diagnoses (Yunus, 2007), and the presence of elevated stressful life events, elevated rates of emotional disorders, and impaired emotion regulation appears to contribute to the development and/or maintenance of these types of chronic pain problems.

Stressful Life Events

One potential contributor to the limited efficacy of standard cognitive-behavioral pain management techniques may be the presence of unresolved life stressors, such as childhood and adult victimization, serious relationship conflict, shame or guilt-ridden actions, or tragic losses. For example, childhood abuse has been associated with many health consequences in adulthood. Walker and colleagues found that women with a history of sexual abuse had more functional disability, more physical symptoms, more medical diagnoses, more emergency room visits, and greater health care costs than those without a trauma history (Walker et al., 1999; Walker et al., 1999). Hulme (2000) described similar consequences in women from a large primary care clinic; those who

had childhood sexual abuse reported twice the physical symptoms, more primary care visits, greater medical charges, and twice the amount of major lifetime surgeries compared with patients without childhood abuse.

People with a history of childhood sexual abuse are much more likely to report chronic pain than people without a sexual abuse history (Finestone et al., 2000). One group of researchers distinguished between childhood abuse, adult abuse, and repeated abuse, and found that all three types of abuse were associated with chronic pain. However, long-term abuse was associated with a greater level of pain than those with reports of childhood and adult abuse alone (Green, Flowe-Valencia, Rosenblum, & Tait, 2001). Similarly, when researchers compared a sample with childhood abuse to a sample with adult domestic violence, both abuse groups reported more pain symptoms than a control group, yet there were no differences in reported pain between the two abuse groups (Kendall-Tackett, Marshall, & Ness, 2003). With the exception of long-term abuse, it does not seem that one type of abuse in either childhood or adulthood is more predictive of chronic pain than another type of abuse.

Additionally, these stressful life events often occur at greater rates in patients who develop the somatoform pain disorders than those who have pain related to disease. For example, patients with FM had a much higher prevalence of childhood and adult victimization than patients with rheumatoid arthritis (Walker et al., 1997). Similarly, patients with IBS also had elevated rates of early life stressors, including sexual and physical abuse, neglect, and loss of primary caregiver in childhood; and rape in adulthood. Furthermore these stressful experiences have been linked with the onset and exacerbation of IBS symptoms (Jarcho & Mayer, 2007). Comparing IBS patients to

patients who have inflammatory bowel disease (a condition with a clear peripheral—autoimmune--etiology) reveals a significantly greater level of physical and sexual abuse in patients with IBS (Ali et al., 2000). In a study of the progression of acute neck and back pain to chronic pain, greater exposure to past traumatic life events and depressed mood were predictive of chronicity (Casey, Greenberg, Nicassio, Harpin, & Hubbard, 2008). These authors also found that more cumulative traumatic events, negative pain beliefs (e.g., that pain may be permanent), and greater depression in a new pain episode was related to increased severity of pain and disability.

The prior studies used clinical samples, and the help-seeking behavior of clinical patients may result in overestimates of traumatic events in these patients. Several epidemiological studies, however, have supported the notion that stressful life events are associated with chronic pain (Goodwin, Hoven, Murison, & Hotopf, 2003; Linton, 2002; McBeth, Macfarlane, Benjamin, Morris, & Silman, 1999). As part of the National Comorbidity Survey, Sachs-Ericsson, Kendall-Tackett, and Hernandez (2007) examined the relationship between childhood abuse and chronic pain in a large community sample. The presence of childhood abuse predicted chronic pain, and the relationship between the abuse and chronic pain was not mediated by depression. This study confirms that the relationship between abuse and chronic pain is not dependent on being in treatment and recruited from treatment sites.

Emotional Disorders

Given the elevated stressful life events reported in chronic pain, one should also find elevated rates of posttraumatic stress disorder (PTSD); indeed, this is the case. Many studies document the comorbidity of chronic pain and PTSD. Patients with

fibromyalgia and irritable bowel syndrome have rates of PTSD up to 37% (Amir et al., 1997; Dobie et al., 2004), and many additional patients demonstrate subclinical symptoms of PTSD (Sherman, Turk, & Okifuji, 2000). Interestingly, the rates of chronic pain in people with a primary diagnosis of PTSD are even higher. Out of 129 consecutive military veterans with PTSD, 80% reported chronic pain (Beckham et al., 1997); this suggests that psychological trauma can precede, and presumably elicit, chronic pain.

In addition to PTSD, other emotional disorders are also elevated in patients with chronic pain, including mood, anxiety, substance abuse, and personality disorders (Twillman, 2007; Weisberg & Boatwright, 2007). In a review of epidemiological data, Twillman (2007) found that mood disorders (major depression and dysthymia) and anxiety disorders (PTSD, generalized anxiety disorder, panic disorder, social phobia) were common in patients with chronic pain. In one study, 68% of patients with chronic pain met criteria for at least one Axis I disorder, whereas only 8% of the control participants met criteria (Conrad et al., 2007). As would be expected with chronic pain, somatoform disorders were most commonly diagnosed (60% vs. 0%); yet, mood disorders (45% vs. 3%), anxiety disorders (23% vs. 1%), substance disorders (19% vs. 2%), and personality disorders (41% vs. 7%) were also substantially elevated.

An examination of the comorbidity between mood, anxiety, alcohol abuse/dependence, and chronic neck or back pain in the worldwide mental health surveys revealed that all three disorder categories were more common among people with pain than those without pain. Mood and anxiety disorders had a stronger association with chronic pain than did alcohol abuse/dependence. Of the anxiety

disorders, generalized anxiety disorder and PTSD showed the strongest association (Demyttenaere et al., 2007). Using the same sample, Scott and colleagues (2007) found that although depression and anxiety were both independently associated with a range of physical conditions, comorbid depression and anxiety had the strongest association with several physical conditions including chronic headache, back and neck problems, and multiple pains. Furthermore, even though the prevalence of mental and physical disorders may differ among ethnic groups, the associations between chronic pain and emotional disorders were virtually identical across different ethnicities (Scott, McGee, Schaaf, & Baxter, 2008). The evidence clearly supports the argument that a variety of emotional disorders are elevated in people with chronic pain, compared with healthy controls. However, the presence of an emotional disorder alone does not seem like a sufficient explanation for chronic pain, especially because the direction of the relationship between chronic pain and emotional disorders is unclear, and emotional disorders may reflect underlying mechanisms that may be responsible for both the emotional disorder and the pain.

Emotion Regulation

Elevated levels of stressful life events and emotional disorders are not the only contributors to the development of chronic pain. Rather, it appears that stressful life events may give rise to impaired emotion regulation, which may then lead to emotional disorders. Although definitions and theoretical views of emotion regulation are still evolving (Rottenberg & Gross, 2007), emotional regulation appears to include at least four processes. The first, emotional awareness, involves attending to one's feelings, differentiating feelings from physical states, and labeling one's feelings. The second

process, emotional expression, involves variations in the degree to which emotions are suppressed or expressed, including their imaginal, verbal, and behavioral expression. A third process can be labeled emotional management, and refers to being able to temper or elicit various emotions as needed for goal attainment. The fourth emotion regulation process, emotional integration, refers to the emotion-facilitated alteration or relearning of maladaptive beliefs and cognitions, with a consequent reduction in negative emotion. This occurs by learning about one's feelings, reflecting on an event's meaning, and either adapting the experience into one's current thinking, or altering one's beliefs to accommodate the experience. This dissertation will focus on the first two processes of emotion regulation: emotional awareness and emotional expression.

Although there is little direct evidence linking emotion inhibition and increased pain, substantial research suggests that when people avoid or inhibit negative emotions, memories, and thoughts stemming from stressful experiences, the central and autonomic nervous systems can trigger or exacerbate pain. For example, patients with fibromyalgia have greater levels of emotion suppression and alexithymia than controls (Brosschot & Aarsse, 2001), and more than half of fibromyalgia patients report difficulty expressing emotions, which is much greater than patients with rheumatoid arthritis or healthy controls (Dailey, Bishop, Russell, & Fletcher, 1990). Furthermore, in response to an induced negative mood and an interpersonal stressor, fibromyalgia patients responded with greater pain than patients with osteoarthritis—a peripheral disease-related pain disorder (Davis, Zautra, & Reich, 2000).

Alexithymia was originally described in people with psychosomatic disorders and is an example of the first emotion regulation process; it encompasses difficulty

identifying feelings, difficulty describing feelings, externally oriented thinking, and a limited imaginal capacity (Nemiah, Freyberger, & Sifneos, 1976; Taylor, Bagby, & Parker, 1997). Elevated levels of alexithymia have been found in a wide range of medical conditions including chronic pain and emotional disorders such as PTSD. The view that alexithymia is a risk factor for medical and psychiatric problems that are influenced by disordered affect regulation is growing in empirical support (Taylor et al., 1997), and recent studies have begun to link alexithymia to pain.

Lumley, Neely, and Burger (2007) described potential pathways by which alexithymia may influence chronic pain. One way is by contributing to symptom reporting. People with alexithymia may be more likely to describe emotional arousal in somatic terms or to report only the physiological sensations of emotion rather than the emotional label. Also, the tendency to notice and be concerned about physical sensations—somatosensory amplification—may be increased in alexithymic individuals. Many research studies have found that people with alexithymia report more somatic symptoms, including pain. One review of 18 samples reported a mean correlation of r = .23 between alexithymia and somatic symptoms (De Gucht & Heiser, 2003). Furthermore, alexithymia is usually greater in people with chronic pain than controls without pain (Ak et al., 2004; Burba et al., 2006; Celikel & Saatcioglu, 2006). For example, alexithymia was associated with nonspecific shoulder pain severity (Miranda et al., 2005) and fibromyalgia (Sayar et al., 2004). In addition, alexithymia is positively associated with pain severity among people with chronic pain. In a large sample of Finish workers with temporomandibular disorder, alexithymia was positively correlated with head, neck, and tooth pain (Ahlberg et al., 2004). In a prospective study of patients

with temporomandibular disorder, Glaros and Lumley (2005) found that not only was alexithymia positively related to pain severity during daily activities even after controlling for depressed mood, but also that the pain severity was unrelated to tissue damage. Alexithymia is also associated with greater affective pain in patients with chronic myofascial pain after controlling for catastrophizing and self-efficacy (Lumley, Smith, & Longo, 2002). It appears that alexithymia is related to increased symptom severity regardless of tissue damage, which may help explain the similar rates of alexithymia in different patient groups.

The second process of emotion regulation that will be studied in this dissertation relates to expression and inhibition of emotions. One line of research examines the common regulatory processes of emotion suppression and positive reappraisal. Studies examining the effect of suppression on emotional experience have found that although suppression is effective at decreasing the outward expression of negative emotions, it actually increases physiological arousal and exacerbates the experience of emotion, compared with not suppressing (Gross & Levinson, 1997; Gross, 1998). These findings are consistent with research documenting the paradoxical nature of thought suppression, which shows that when participants are instructed to suppress a thought there is actually increased thought on that topic (Gold & Wegner, 1995; Wegner Schneider, Carter, & White, 1987). In addition to affecting emotional experience, suppression also increases physiological responding (Gross, 2001). For example, participants instructed to suppress emotions of disgust experienced greater constriction of blood vessels. These effects have also been replicated for amusement and sadness but do not occur when participants are instructed to express during a neutral stimulus or

when instructed to reappraise. Thus, Gross (2001) concludes that the act of inhibiting the expression of emotions impacts physiological factors.

The use of emotional suppression as a regulation strategy has been linked to the development and maintenance of psychopathology (Amstadter, 2008; Gross & John, 1998). For example, in a sample of Vietnam veterans, those with PTSD used more suppression of both negative and positive emotions than those without a PTSD diagnosis (Roemer, Litz, Orsillo, & Wagner, 2001). More importantly, greater use of suppression was related to greater severity of PTSD symptoms. Therefore, using suppression as an emotion regulation strategy leads to increased negative emotions and decreased positive emotions in people with PTSD.

A few studies have researched the effects that anger suppression has on pain. Some of the studies have demonstrated the negative effects of suppression on experimental pain in healthy controls. Quartana, Yoon, and Burns (2007) found that participants in an emotion suppression condition experienced greater pain on a cold-pressor test during anger provocation than the control condition. These researchers also found support for a paradoxical process by which suppressing anger actually increases cognitive accessibility of anger. Another study by Quartana and Burns (2007) concluded that anger suppression may lead to increased pain because participants in the anger suppression condition rated the anger specific dimensions of pain higher than the control condition. Recently, this research has been replicated in patients with chronic low back pain. Patients were harassed during a computer maze task and were randomized to either a suppression or no suppression group. Burns and colleagues (2008) found that patients in the anger suppression group had significantly more pain

and pain behaviors than the non-suppression group at a subsequent time while completing a task designed to mimic everyday activities. Furthermore, degree of anger and not anxiety or sadness accounted for the differences between the two groups.

Even though there is not much research examining the direct effects of avoiding emotions on chronic pain, there is a line of research demonstrating the detrimental effects of experiential avoidance. Experiential avoidance is the attempt to escape or avoid private experiences, typically thoughts, feelings, memories (Hayes & Wilson, 1993). In the coping literature, there are two methods of avoidance coping that have been linked to negative outcomes. Avoidant coping and emotion focused coping, which consists of many items that measure avoidance, predict poor clinical outcomes in a variety of mental health problems (DeGenova, Patton, Jurich, & MacDermid, 1994; Leitenberg, Greenwald, & Cado, 1992). Hayes and colleagues argue that experiential avoidance can actually account for the development and maintenance of many psychological disorders, including substance disorders, obsessive compulsive disorder, panic disorder with agoraphobia, and borderline personality disorder as well as the negative effects of childhood sexual abuse (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996).

The research on experiential avoidance is consistent with the PTSD literature, a diagnosis that is highly comorbid with some chronic pain disorders, and that appears to result directly from experiential avoidance of affectively charged memories. Avoidance of stimuli associated with the trauma, re-experiencing an element of the trauma, and increased sympathetic arousal are criteria of the PTSD diagnosis according to the Diagnostic and Statistical Manual, IV-TR (American Psychiatric Association, 2000). The

paradoxical effects of thought and emotion suppression noted above may help explain the relationship among these three criteria of PTSD. The patient avoids aspects of the trauma because they are upsetting and, therefore, the patient is actually more likely to re-experience thoughts, feelings, or memories leading to more sympathetic nervous system arousal. Furthermore, among patients with PTSD, the use of avoidant coping was related to PTSD symptoms at a 1-year follow-up after controlling for initial severity (Krause, Kaltman, Goodman, & Dutton, 2008). Thus, the research on experiential evidence and its similarities with PTSD suggests that emotional avoidance is an important target for chronic pain interventions.

Addressing Unresolved Stress and Emotions

Even though the role of stress, trauma, and emotion regulation in contributing to chronic pain has been documented, there is no validated psychological treatment that directly targets pain patients' unresolved stress and emotional avoidance. Lesserman (2005) reviewed treatments for PTSD and chronic pain and concluded that there is a need for exposure-based treatments for chronic pain patients with a PTSD diagnosis or with a trauma history. Although not much progress has been made since this 2005 review, there are several other current interventions and techniques that provide support for the rationale of an emotional exposure or emotional processing type of treatment. Also available is a potentially exciting and effective psychosocial treatment that helps patients recognize the key role of stress and emotions in their experience of chronic pain, and this dissertation will focus on the efficacy of this latter intervention.

Written emotional disclosure, or expressive writing, a technique introduced by Pennebaker and Beall (1986), attempts to help participants resolve stress by writing

about their thoughts and feelings related to a traumatic event. Participants are typically randomized to writing about stress or trauma or to a control writing condition and write for several days. Originally, written emotional disclosure was tested in healthy populations and found to lead to significant improvements in health and functioning (Smyth, 1998). However, studies of the effects of writing about stress in chronic pain populations yielded less impressive results. Published studies show written emotional disclosure has weak effects on pain and other medical conditions (Broderick, Stone, Smyth, & Kaell, 2004; Frisina, Borod, & Lepore, 2004; Kelley, Lumley, & Leisen, 1997; Meads, Lyons, & Carroll, 2003; Norman, Lumley, Dooley, & Diamond, 2006). Although many of the studies do not seem to support the use of this technique for chronic pain, there have been two studies of written emotional disclosure in patients with fibromyalgia that have demonstrated positive results (Broderick, Junghaenel, & Schwartz, 2005; Gillis, Lumley, Mosley-Williams, Leisen, & Roehrs, 2006). The benefits found in patients with fibromyalgia may be attributed to the higher levels of unresolved stress found in this group than in patient groups with rheumatoid arthritis or headaches. It is possible that this technique is too brief and too limited in focus to produce positive effects. Furthermore, it requires participants to identify their key issues themselves, a skill that may be lacking in many participants. WED could still be useful as a component of a treatment targeting unresolved stress and emotions.

Some of the largest support for an exposure-based treatment that targets unresolved stress and emotional avoidance stems from the literature on exposure-based treatments for anxiety disorders. The use of imaginal and in vivo exposure without allowing the patients to avoid or escape the anxiety-provoking stimuli has shown

significant success for treating phobias, obsessive-compulsive disorder, and PTSD (Barlow & Lehman, 1996). Patients experience the feared and avoided stimulus—either an object, situation, or affective memories—in a safe and predictable environment with the support of the therapist.

With the exception of several studies of written emotional disclosure, which show modest benefit for chronic pain, emotional-exposure based techniques have not been applied to chronic pain patients. However, Lumley and colleagues (2008) have developed an emotional exposure-based intervention to address the unresolved trauma identified in some patients with chronic pain. This treatment attempts to identify avoided experiences and encourage the patient to engage in exposure exercises so that emotional processing and relearning occur, leading to improved pain and health. Techniques such as education about experiential avoidance, written emotional disclosure, imaginal and in vivo exposure, and meta-communication among others are used to accomplish this purpose. Although this treatment is still under development and has not been validated in a controlled trial, a preliminary report evaluating the treatment's efficacy for patients with fibromyalgia shows promising results (Lumley et al., 2008). In a sample of ten patients, there were significant improvements in unresolved stress symptoms, and marginally significant improvements in overall fibromyalgia symptoms, emotional distress, life satisfaction, and disability. Furthermore, reliable change indices showed that six of the 10 patients made at least moderate and meaningful changes.

Much more research is needed on psychosocial treatments that target emotional avoidance that might underlie pain, especially pain found in people with somatoform

pain disorders (those without clear, contributing organic disease). Schubiner, a physician at Providence Hospital in Michigan, has created a 4-session group psychosocial treatment for patients with a diverse range of chronic pain problems. He was influenced by the work of Sarno (1998), who argued persuasively in the book, *The Mindbody Prescription*, that the many musculoskeletal pain problems that lack identifiable pathology are caused by repressed emotions. Sarno proposed that seemingly diverse pain problems are different manifestations of what he termed "tension myositis syndrome," and should be treated by repudiating the medical diagnosis for the pain and accepting the psychological cause for the pain (repressed emotions). Schubiner has labeled the chronic pain problems in his treatment mind body syndrome (MBS)/tension myositis syndrome (TMS). His treatment uses readings, writing about emotions, meditation, and other techniques to help people identify, understand, and verbalize emotions related to stressful life events or emotional conflict. Schubiner's treatment program, entitled, "Healing Yourself in Six Steps," has these components:

1. Recognizing the True Disorder (TMS): Repudiating the Physical
2. Reading about TMS Each Day
3. Writing Exercises: Write Away Your Symptoms
4. Reflecting Exercises: Mindfulness Practice for Healing
5. Reprogramming the Mind: Self-Talk and Training the Unconscious
6. Rebuilding Your Life: Moving Towards the Light

Many of Schubiner's patients anecdotally report benefits including large improvements in pain. One controlled study has evaluated the effects of this treatment

compared to a wait-list control with a small sample of fibromyalgia patients (Hsu, Schubiner, Lumley, Stracks, Clauw, & Williams, in press). At a 6-month follow-up patients in the intervention group reported significantly lower pain severity, higher self-reported physical functioning, and higher tender-point threshold compared to the control group. Additionally, nearly half of the patients in the intervention group had at least a 30% reduction in pain severity compared to no patients in the control group. The effect of this treatment is still unknown outside of a randomized controlled trial with a broad range of chronic pain patients. Furthermore, research is still needed to identify moderators and mediators of this treatment protocol.

Predictors of Treatment Outcome

The presence of different types of chronic pain suggests that the "pain-patient homogeneity" myth should be discarded, and instead, factors that contribute to differential responding should be identified (Turk & Okifuji, 1998). Not all pain patients will have stressful life events or unresolved emotional conflict that is causing or exacerbating their pain. Furthermore, even some patients who do have unresolved emotional issues will not respond to this intervention for various reasons, such as varying motivation, adherence, emotional abilities, and so on. Most of the research on evaluating predictors of treatment response has been conducted with cognitive behavioral treatments, and few predictors of treatment success have been identified. In a study of CBT for temporomandibular disorder, patients with greater baseline somatization, depressive symptoms, number of pain sites, rumination, catastrophizing, and perceived stress had greater activity interference one year after treatment; however, none of these variables predicted change in pain (Turner, Holtzman, & Mancl,

2007). Even though this type of emotion-focused treatment has not been systematically evaluated, a review of the literature suggests several potential predictors of outcomes that may be relevant for a treatment that targets unresolved stress and poor emotion regulation, including baseline depression, stress, emotion regulation, and attitudes toward treatment.

Alexithymia is one of the most researched emotion regulation predictors, and it appears that alexithymia usually predicts poorer outcomes of emotion-oriented treatments. Some studies suggest that patients who are alexithymic respond more poorly to emotion-oriented interventions. A dissertation examining the effects of an internet-based emotional disclosure intervention in kidney transplant patients found that although patients who typically suppress their emotions benefitted more from disclosure, patients who were alexithymic benefited less (Posemato, 2008). Similarly, in a study of expressive talking in rheumatoid arthritis patients, alexithymia overall did not moderate outcome, however, higher scores on the subscale difficulty identifying feelings predicted increased disability in the expressive talking condition but not in the control condition (Kelley et al., 1997). The role of alexithymia as a predictor of worse outcome was also found in a sample of chronic pelvic pain patients (Norman et al., 2004). In this study, greater alexithymia scores predicted increased pain in the emotional disclosure group but not in the control.

Even though alexithymia interfered with positive results in the prior studies, there are also examples of alexithymia predicting better outcomes. A study of emotional disclosure with university students found that the difficulty describing feelings subscale of alexithymia predicted improved physician illness visits, depression symptoms, and

sleep disturbance after written disclosure, but externally oriented thinking subscale predicted increased intrusion and hyperarousal symptoms. (Baikie, 2008). An examination of psychological responses and recovery following bladder surgery found that the alexithymia total score and the subscale difficulty identifying feelings predicted better outcome following emotional disclosure about the upcoming surgery as compared with controls (Solano, Donati, Pecci, Persichetti, & Colaci, 2003).

Several factors regarding the participants' thoughts and behavior during treatment have been found to predict treatment outcome. Participants who were most adherent to a treatment protocol had the greatest reduction in pain intensity (Basler & Hans, 1990). Treatment expectancy also has been found to predict outcome in cognitive behavioral treatments for chronic pain. Using a sample of patients with fibromyalgia and chronic low back pain from two randomized controlled trials, researchers found that pretreatment expectancy significantly predicted outcome both immediately and at a 12-month follow-up (Goossens, Vlaeyen, Hidding, Kole-Snijders, & Evers, 2005). In addition to treatment expectancy, the perceived credibility of the treatment seems important as well. In another sample with chronic low back pain, treatment credibility was one of the strongest predictors of outcome regardless of which condition the participants were assigned (Kole-Snijders, et al. 1999).

Preparing Patients for Treatment: Emotional Assessment

As discussed above emotion regulation involves many components. The ability to express emotions and wishes/needs in an open manner and free from anxiety is an important manifestation of healthy emotional functioning, and one that is of interest for this dissertation. One method of categorizing relational emotions is to consider two

domains of autonomy/independence and attachment/dependence. The autonomy/independence domain consists of the ability to say no, to disagree with another's opinion, and to communicate emotions like anger. The attachment/dependence domain consists of the ability to ask for help and to communicate gratitude and emotions such as guilt and love. Mental health is indicated by having healthy awareness and expression of both of these needs.

Many patients, however, are not always able to identify avoided emotions nor do they recognize the impact of not expressing these emotions on other aspects of their lives, particularly their pain. Therefore, this dissertation will include an assessment intervention that is meant to help patients in this regard.

The format of this behavioral assessment was partially influenced by Finn's work on therapeutic assessment (Finn, 1996; Finn, 2003). Finn considers assessment a semi-structured collaborative process that includes various assessment tools and what he has termed "assessment intervention sessions." The goal of these sessions is to explore hypotheses and help the client reach new understanding. Finn often uses therapeutic assessment as a tool to help patients and therapists identify targets for therapy, particularly in situations when there is no improvement in treatment.

Therapeutic assessment can be a useful tool to help prepare patients for treatment so that they will have better outcomes. One way to help prepare patients for an emotion-focused intervention such as the one that Schubiner offers, and which is the focus of this dissertation, is by making the avoided emotional and relational stimuli more salient. It would be ideal to help patients not only report their avoidance behavior with respect to autonomy/independence and attachment/dependence, but also to test the

avoidance behaviorally/experientially and then, importantly, have patients explore how these assessment data are linked with their core issues, needs, stressors, emotions, and pain. This emotional assessment approach is novel, but it may make patients more open or motivated for this type of treatment.

Goals and Hypotheses

This study sought to further our understanding of emotion-focused treatments for patients with chronic pain that target unresolved stress and avoided emotions. Although, it has been demonstrated that patients with chronic pain have elevated stressful life events, emotional disorders, and poor emotion regulation, particularly avoidance or inhibition of key emotions, there is a dearth of research on treating these problems. The current study has three main goals to address the current limitations of the research.

Evaluating treatment outcome. The first goal of the current study was to evaluate Schubiner's intervention by determining the effects of this intervention using a pre-test, post-test, and 3-month follow-up design. Although a randomized, controlled trial is considered the gold standard experimental design for determining efficacy, an initial step in the development of interventions is to evaluate change in an uncontrolled study. Calculating effect sizes as well as the number of people who benefit from the treatment are significant steps in the evaluation process.

Hypothesis 1. It was hypothesized that participating in this treatment would lead to improvements in chronic pain, pain-related disability, depression, and quality of life. Specifically, greater than one-third of the participants were hypothesized to improve after this intervention, which is the percentage of patients Turk found improved in a review of CBT treatments.

Identifying Predictors of Treatment Outcome. Given the evidence that not all patients respond to an intervention, the second goal of this study was to identify the factors that predict to successful outcomes in this intervention. Because this was a single group study, I could not examine actual moderators of treatment outcome, rather I examined several variables that may predict treatment outcome. As described above, patients with increased emotional disorders, stressful life events, and in some cases poor emotion regulation often have poorer treatment outcomes than pain patients without these characteristics. Therefore, these predictors were examined in this dissertation. Because treatment credibility and expectancy have predicted better outcomes in cognitive behavioral treatments, these factors were studied as well.

Hypothesis 2. It was hypothesized that higher baseline levels of depression, stressful life events, and poor emotion regulation skills would predict poorer outcomes of treatment. In addition, higher baseline ratings of treatment credibility and expectancy would predict better treatment outcomes than low treatment credibility and expectancy.

Novel Behavioral Assessment of Emotional Ability. The third goal of the current study was to develop and test an innovative type of emotional assessment method, in which the capacity to express emotions in an interpersonal context is assessed and the explored. Half of the participants were randomized to receive the additional emotional assessment. The goal of this assessment is to help prepare patients for treatment, and thus, it would be important to compare the two groups on outcome measures.

Hypothesis 3. It was hypothesized that the participants randomly assigned to the novel behavioral assessment group would have better outcomes than the participants assigned to the standard assessment group.

CHAPTER 2

METHOD

Participants

Participants were patients with chronic pain referred for the treatment program at Providence Hospital/St. John's Health System. Participants reported chronic pain for at least 3 months duration as their primary symptom and had a pain problem in which substantial psychological factors are believed to contribute to the pain. Thus, pain patients included those with diagnoses of fibromyalgia (FM), irritable bowel syndrome (IBS), chronic low back pain (CLBP), temporomandibular disorder (TMD), myofascial pain syndrome (MPS), regional soft tissue pain syndrome (RSTPS), migraine headache, and tension-type headache. Additional pain types (e.g., neck and shoulder, non-cardiac chest pain) were included if no clear peripheral organic etiology was suspected. Patients were excluded who have pain disorders that are secondary to primary organic diseases (e.g., rheumatoid arthritis, inflammatory bowel disease, multiple sclerosis, lupus, sickle cell, cancer). Additional criteria for exclusion were the presence of current psychotic disorder, active suicidality or homicidality, current alcohol or drug dependence, dementia, mental retardation, or non-literacy in English—all of which were assessed by the evaluating physician.

Procedure

Patients referred to Schubiner's treatment program were first screened over the telephone by Schubiner, and if deemed appropriate for treatment, were asked to purchase and read Sarno's book, *The Mindbody Prescription* (1998). At this time, patients were mailed a set of background clinical measures, which included several pain and functioning measures analyzed in this study. Patients then met with Schubiner who

completed his standard evaluation, which included a medical history and physical examination to confirm inclusion criteria, rule out organic disease as the primary cause of the pain, and to help patients recognize the key role of stress and emotions in their experience of pain. Schubiner described the study to patients who signed up for his intervention and asked them for permission to be contacted by a researcher. These patients were contacted by one of the interviewers on the research team to schedule a meeting at Providence Hospital. Potential participants then completed the written informed consent document (See Appendix A), approved by the Human Investigation Committees of both Providence Hospital and Wayne State University. Upon completion of the informed consent, participants completed the pre-treatment assessment, the treatment, and the post-treatment and 3-month follow-up assessment. The pre-treatment assessment and the treatment occurred at Providence Hospital. Initially, the post-treatment assessment was completed at the hospital and the 3-month follow-up was mailed to the participants. However, to reduce the burden on participants, the post-treatment assessment was mailed to them as well. Participants were also compensated $90 for completing both assessments. They received $50 for completing the pre-treatment assessment, $30 for completing the post-treatment assessment, and $10 for completing the 3-month follow-up.

Seventy-three patients agreed to be contacted by the research team. A total of 46 patients (63%) enrolled in the study. The remaining 37% did not participate for the following reasons: not interested (33%), did not participate in the treatment (22%), could not complete the baseline assessment before the start of treatment (19%), never returned the initial call (11%), did not report pain as a primary problem (7%), unknown

(4%). At the time of data analysis, 4 participants had not returned follow-up data yet. Three of the participants (7%) dropped out of the study and did not provide any follow-up data (one participant never took the treatment and two were for unknown reasons). Of the 39 participants who remained in the study and provided post-treatment data, 32 (82%) provided 3-month follow-up data by the time of the analysis cut-off point. The sample averaged 51.05 years of age (SD = 15.52). The majority were women (76.1%) and Caucasian (91.3%). One participant each was African American, Middle Eastern, and Armenian. One participant did not identify an ethnicity.

Baseline assessment. Participants underwent a comprehensive psychosocial assessment which included completion of the outcome measures as well as stress and emotion regulation measures.

Experimental Emotional Assessment. Additionally, half of the participants were randomized to a group that included a novel emotional assessment that assessed the capacity to express emotions (Appendix B). The behavioral tests are comprised of two dimensions: dominance/autonomy and vulnerability/attachment. After the behavioral task, these participants then engaged in a discussion with the interviewer to explore links between their assessment and their histories, relationships, and pain to help prepare them for the treatment. The goal of this additional assessment was to help the participants create further awareness that may help identify key targets for the intervention. The behavioral assessment and the following discussion were completed by trained clinical graduate students. These sessions were also audio-taped; however, because this assessment is under development, these tapes will be analyzed at a future time.

Psychosocial Treatment. This manualized intervention for mind-body syndrome (MBS)/tension myositis syndrome (TMS), created and provided by Howard Schubiner, M.D., involves a medical history and evaluation followed by tailored education about the patient's unique pain onset and course, related to stressful life events. This is designed to help patients recognize the key role of stress and emotions in their experience of pain. Patients then take a 4-session class that uses readings, writing about emotions, meditation, and other techniques to help people identify, understand, and verbalize emotions related to stress. Patients are instructed to complete daily homework assignments that include reading, writing, reflecting, reprogramming the mind, and rebuilding exercises, which typically total one hour each day. Classes usually include six to ten patients and occur once per week for four weeks at Providence Hospital. Each class is two hours.

Post-treatment Assessment. Following completion of the treatment, participants then completed the outcome measures again as well as measures of treatment engagement and adherence. As mentioned above, this assessment was initially completed in person at Providence Hospital but was later modified to be completed through the mail to reduce patient burden.

3-month Follow Up Assessment. Participants were mailed the primary outcome measures along with a pre-stamped, self-addressed envelope for returning the completed measures.

Measures

There were two sets of measures in this study. At the baseline and post-treatment psychosocial assessments, participants completed a standard set of clinical

outcome measures of adjustment: general health, pain, disability, psychological impairment, health care utilization, and attitudes toward treatment. At the baseline assessment only, participants also completed measures of stressful life events, emotional disorders, and emotion regulation, which served as potential predictor variables. Three of the outcome measures (Brief Pain Inventory, Center for Epidemiological Studies-Depression, and Satisfaction with Life) were given to the patients as part of routine clinical care and were completed prior to their initial medical evaluation. These measures were classified as "pre-baseline." The remaining measures were classified as "baseline" when completed prior to treatment, as "post-treatment" when completed following completion of the treatment, and as "3-month follow-up" when completed at the 3-month follow-up assessment.

Primary Outcome Measures (Pre-baseline, Post-treatment, and Follow-up)

This dissertation assessed measures of general health, pain, disability, psychological impairment, and relationship problems.

Pain. Pain severity and pain-related disability were assessed using the Brief Pain Inventory (BPI; Daut, Cleeland, & Flanery, 1983). It assessed pain severity and pain interference with a 0 to 10 scale with 10 indicating greater severity. The pain severity items ask responders to rate their pain at the present moment in time and their worst, least, and average pain over the past week. For this study, these items were averaged to form a pain severity score. There are also 12 items that ask patients to rate how much their pain interfered with the activity listed. Because of an error printing the measure for this study, only the first 4 disability items were included (general activity, mood, mobility, and normal work), thus, these items were averaged to produce a pain-

related disability score. Alpha in this sample was 0.90 for the pain severity items and 0.86 for the disability items.

Depression. The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) is a 20-item scale that measures depressive symptomatology. Participants are instructed to focus on depressed mood during the past week. This scale can be analyzed as a continuous measure of the relative degree of depressive symptoms, or it can be analyzed as a dichotomous measure using a cut-off score of 16, with scores above 16 indicating symptom levels suggestive of depression. Normative studies have found rates between 8.7% and 17.4% of women scoring above 16 on the CES-D (Knight, Williams, Mcgee & Olaman, 1997; Myers & Weissman, 1980; Roberts & Vernon, 1983). This measure was mailed to participants prior to the baseline assessment. Alpha in this sample was 0.91.

Life satisfaction. The 5-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) was administered to measure one's perception of general life satisfaction. Items were rated on a 1 to 7 scale and averaged; higher scores indicate greater global life satisfaction. Alpha in this sample was 0.85.

Secondary Outcome Measures (Baseline, Post-treatment, and Follow-up)

Affective and sensory dimensions of pain. The McGill Pain Questionnaire-Short Form (Melzak, 1997) was used to assess sensory and affective dimensions of pain that patients have experienced over the prior week. This 15-item self-report presents 11 sensory adjectives and 4 affective adjectives rated on a 0 (none) to 3 (severe) scale. Discriminate validity is good with the demonstrated ability to distinguish various types of

pain, particularly acute versus chronic pain. Alpha in this sample was 0.86 for the sensory subscale and 0.78 for the affective subscale.

Chronic pain acceptance. The Chronic Pain Acceptance Questionnaire (CPAQ; McCracken, Vowles, & Eccleston, 2004) is a 20-item measure of pain-related acceptance. It has 2 subscales: Activity Engagement and Pain Willingness. The items are rated on a 0 (never true) to 6 (always true) scale with higher scores indicating greater acceptance. The CPAQ has good internal consistency, test-retest reliability, and validity (McCracken & Eccleston, 2005; McCracken et al., 2004, 2005). In this study, the total score was analyzed. Alpha in this sample was 0.88.

Stress cognitions and symptoms. The Impact of Events Scale-Revised (Weiss & Marmar, 1997) is a 22-item scale that assesses symptoms of cognitive intrusions, cognitive avoidance, and hyperarousal during the past week with respect to a specific stressful event. In this study, participants were instructed to identify the single most stressful event or experience that they have had and that continues to bother them, and to answer questions with respect to that event. The items are ranked on a 5-point scale (0 = not at all and 4 = extremely). The scale has excellent internal consistency reliability (alpha = .96) and was found to correlate highly (r = .84) with the PTSD Checklist, a measure designed to assess DSM-IV symptoms of PTSD (Creamer, Bell, & Failla, 2003). Participants identified a stressor upon completion of the baseline assessment and wrote it on the questionnaire and were instructed to complete the questionnaire with respect to that stressor at the post-treatment assessment. Alpha in this sample was 0.93.

General Emotional Distress. The Brief Symptom Inventory (BSI; Deragotis, 1975) was used to assess general emotional distress. The measures consists of 53 items rated on a 0 (not at all) to 5 (extremely) scale indicating level of distress about each symptom over the past 7 days. There are 3 global indices that broadly assess emotional distress (Global Severity Index (GSI), Positive Symptom Distress Index, and Positive Symptom Total) in addition to 9 subscales (Somatization, Obsession-Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic anxiety, Paranoid ideation and Psychoticism) that measure more specific symptoms of distress. The GSI is the most broadly used global score and has good test-retest reliability and validity (Conoley & Kramer, 1989; Deragotis, 1993; Derogatis, Rickels, & Rock, 1976). Only the GSI was analyzed for this study. Alpha in this sample was 0.93.

Predictor Measures (Baseline only)

Stressful Life Events. The Life Stressor Checklist-Revised (Wolfe, Kimerling, & Brown, 1993; Wolfe, Kimerling, Brown, Chresman & Levin, 1996) contains 30 life stress items that meet DSM-IV-TR criteria for PTSD along with other stressful life experiences. The PTSD qualifying items also ask participants about their perception of harm or lethality, the intensity of their emotional reaction, and how much the event has affected them during the past year on a 1 to 5 scale. The non-PTSD questions only ask about the stressful experience's effect during the past year. The Life Stressor Checklist-Revised has demonstrated good criterion-related validity for PTSD in women and has performed adequately in populations with comorbid substance abuse and other psychological disorders (McHugo et al. 2005; Wolfe & Kimmerling, 1997). The number

of stressful life events was summed and analyzed in this study along with the average level of distress associated with the stressful life events.

Alexithymia. The Toronto Alexithymia Scale-20 (TAS-20; Bagby, Parker, & Taylor, 1994) assesses not only the global alexithymia construct, but also three facets of alexithymia: difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking. The scale has good reliability and is the most extensively validated measure of alexithymia (Bagby, Taylor, & Parker, 1994). Because the three subscales of the TAS-20 appear to have differential validity and tap different aspects of emotional regulation, the subscales were analyzed as well as the total score. Alpha in this sample was 0.86 for the total score, 0.81 for the difficulty identifying feelings subscale, 0.78 for the difficulty describing feelings subscale, and 0.56 for the externally oriented thinking subscale.

Emotional awareness. The 10-item version of the Levels of Emotional Awareness Scale (LEAS; Lane et al., 1990) was also administered. This measure presents short, emotionally provocative vignettes, and participants are asked to write on a sheet of paper how they would feel as well as how the other person in the vignette would feel. A scoring manual was used to rate these responses for the sophistication or complexity of their emotional language. This measure has good internal consistency, very high interrater reliability, and predicts a range of criteria, including ability to identify emotions in faces, hemispheric dominance, and anterior cingulate gyrus activity (Lane et al., 1995, 1996, 1998). Trained undergraduate students rated the responses using the scoring manual.

Emotional expression conflict. The 28-item Ambivalence Over Emotional Expression Questionnaire (AEQ; King & Emmons, 1990) was used to assess the experience of both desiring to express emotion and the conscious inhibition of doing so. The AEQ has high reliability and predicts negative mood and physical symptoms better than measures of the frequency of expressing emotion (King & Emmons, 1990). Alpha in this sample was 0.81.

Treatment Attitudes Survey. This 10-item survey assessed participants' thoughts regarding the rationale of the intervention. Participants rated their beliefs on a 5-point scale to questions like: "How much do you think that stressful life events or trauma cased your pain problem?", "How much do you think that the source of your pain is in your mind?", and "How much do you think that your mind can eliminate the pain?" Alpha in this sample was 0.84.

In addition, because baseline levels of some of the outcome measures may predict who benefits from this treatment, several outcome measures were also explored as predictor variables. Specifically, baseline levels of depression (CES-D) and emotional distress (BSI) were tested as predictors.

Data Analysis

The data was checked for accuracy and frequency distributions of all items and scored variables were examined for outlier variables. Internal consistency (alpha) was assessed for all scales.

Hypothesis 1

Several analyses were conducted to determine the effects of the intervention on chronic pain, pain-related disability, depression, and quality of life. First, a series of

paired-sample t-tests were used to determine the statistical significance of changes from baseline to post-treatment and baseline to the 3-month follow-up. Second, effect sizes were calculated to determine the magnitude of change at both of these time points. The effect sizes were calculated using Cohen's d (post-treatment mean – baseline mean/baseline standard deviation). Values of 0.2, 0.5, and 0.8 are considered small, medium, and large respectively. Finally, individual patient outcomes were examined using the reliable change index (RCI), which indicates how much change occurred while accounting for measurement error across time. It is a ratio of the individual patient's change score (follow-up value minus baseline value) to the sample's standard error of the difference between the score. The formula for the standard error of measurement includes the baseline standard deviation and reliability (Cronbach's alpha) of the measure. A separate RCI was calculated for both the post-treatment and the 3-month follow-up. Two cut-offs were used to determine the magnitude of individual change: 1.96 ($p < .05$), which represents a large effect but is very conservative, and 0.50, which represents a moderate effect.

Hypothesis 2

To identify predictors of treatment outcome, a series of partial correlations were used. Each predictor was correlated separately with each outcome measure change score; that is the difference between baseline and outcome (post minus pre values). The correlations were statistically adjusted for patients' age and gender, because these variables were related to one or more of the predictors.

Hypothesis 3

To determine the effects of the novel emotion communication assessment on outcomes, separate ANCOVAs examined whether the participants who received the therapeutic assessment did better on outcome measures than those who did not receive it. Group was used as the independent variable, and the change scores at post-treatment and 3-months were used as the dependent variable. These analyses covaried age, which was marginally significant different between the two groups at baseline.

Chapter 3

Results

Estimating changes in outcome

A set of paired-sample t-tests were conducted to evaluate the impact of the intervention on the participants' pain, pain-related disability, pain acceptance, depression, general emotional functioning, and quality of life at both post-treatment and at the 3-month follow-up. In addition effect sizes were calculated using Cohen's d to determine the magnitude of change on the outcome measures. The complete results of these t-tests and effect sizes are presented in Table 1.

These analyses indicated that there were statistically significant improvements for the sample overall, for all measures at both post-treatment and at 3-month follow-up. Participants reported improved pain scores on multiple dimensions. First, they rated their pain on a 1-10 scale (BPI) significantly lower at both time points compared with baseline. The magnitude of this effect was large at both time points as well (d = 1.21 and 1.16, respectively). Second, participants endorsed significantly fewer sensory and affective descriptions of pain at both time points. Interestingly, the magnitude of this difference was somewhat less strong than with the BPI measure of pain at both post-treatment (d = 0.75) and 3-months (d = 0.78). Participants also reported significantly less pain-related disability at both follow-up assessments with a very large effect size at both time points (d = 1.42 and 1.33, respectively). Additionally, participants not only reported less pain, they also reported significantly more acceptance of their chronic pain on a measure that assesses willingness to tolerate pain and to engage in activities regardless of pain. The magnitude of this change was also large at post-treatment (d =

0.97) and the 3-month follow-up assessment (d = 1.16). Improvement was also noted on multiple dimensions of mood and emotional functioning but with more variability in the magnitude of improvement than with the pain-related measures. First, participants reported significantly less depression on the CES-D at both follow-up time points compared with baseline. The magnitude of this change was large at post-treatment (d = 1.04) and somewhat reduced but still large at the 3-month follow-up (d = 0.81). The global severity index of the BSI, which measures general emotional distress, was also significantly reduced at follow-up. At post-treatment, this effect size was moderate to large (d = 0.75) but decreased to a small to moderate effect at 3 months (d = 0.47). Finally, participants reported significantly fewer symptoms of unresolved stress symptoms as reflected by cognitive intrusions, cognitive avoidance, and hyperarousal with respect to a specific stressful event. The moderate to large magnitude of change on this measure was maintained at both follow-up assessments (d = 0.75 and 0.78, respectively).

On the final domain assessed, satisfaction with life, participants reported significantly more general satisfaction with life at post-treatment and at the 3-month follow-up. However, the magnitude of change for this measure was smaller than the other outcome measures--the effect size was small to moderate at both time points (d = 0.44 and 0.39, respectively).

TABLE 1. Baseline, Post-treatment, and Follow-up Data and Analyses of Change

Outcome Measure	Mean (SD)	Change from baseline	*t*	*p*	Effect Size (*d*)
BPI Pain					
Baseline	5.49 (1.91)				
Post-treatment	3.18 (1.86)	-2.31	-7.47	< .01	-1.21
3-month	3.03 (1.83)	-2.32	-6.30	< .01	-1.16
BPI Disability					
Baseline	6.01 (2.12)				
Post-treatment	2.99 (2.26)	-3.02	-8.34	< .01	-1.42
3-month	3.07 (2.31)	-2.81	-5.46	< .01	-1.33
MPQ Sensory Pain					
Baseline	10.09 (6.71)				
Post-treatment	5.09 (4.92)	-5.01	-5.16	< .01	-0.75
3-month	6.20 (4.82)	-4.85	-3.85	<.01	-0.69
MPQ Affective Pain					
Baseline	4.00 (3.52)				
Post-treatment	1.27 (1.30)	-2.73	-4.96	< .01	-0.78
3-month	2.10 (2.78)	-2.23	-4.17	< .01	-0.62
Pain Acceptance					
Baseline	47.56 (16.90)				
Post-treatment	63.90 (18.56)	16.33	5.87	< .01	0.97
3-month	65.74 (17.96)	20.00	4.94	< .01	1.16
Depression					
Baseline	27.69 (12.20)				
Post-treatment	15.00 (10.76)	-12.69	-6.33	< .01	-1.04
3-month	18.31 (13.07)	-10.27	-4.60	< .01	-0.81
General Emotional Symptoms					
Baseline	57.54 (32.29)				
Post-treatment	33.16 (26.46)	-24.37	-6.76	< .01	-0.75
3-month	45.00 (37.35)	-16.05	-3.19	< .01	-0.47
Unresolved Stress					
Baseline	29.17 (19.20)				
Post-treatment	14.68 (10.19)	-14.49	-5.61	< .01	-0.75
3-month	14.83 (12.74)	-15.70	-5.18	< .01	-0.78
Satisfaction with Life					
Baseline	3.21 (1.51)				
Post-treatment	3.87 (1.53)	0.66	4.01	< .01	0.44
3-month	3.74 (1.60)	0.61	2.64	< .05	0.39

Note. Paired sample t-tests and effect size calculation included only those participants who provided data at that follow-up point. N = 38 at post-treatment and 30 at 3-months for the BPI, Depression, Unresolved Stress, and Satisfaction with Life measures. N = 37 at post-treatment and 30 at 3-months for the McGill. N = 39 at post-treatment and 31 at 3-months for Pain Acceptance and General Emotional Symptoms.

Individual Responder Rates

Individual patient outcomes were also examined using the reliable change index (RCI), which indicates how much change occurred while accounting for measurement error across time. These results are presented in Table 2.

On the Brief Pain Inventory, 86.9% of the participants showed at least moderate effects, with 65.8% of the sample obtaining large effects at post-treatment. Similar effects were found at the 3-month follow-up assessment; 83.8% showed at least moderate effects, with 60% of the sample obtaining large effects. The disability items of the BPI led to similar results as well; 82% of the participants showed at least moderate effects, with 66% of the sample obtaining large effects. At 3 months, 80% showed at least moderate effects, with 50% of the sample obtaining large effects.

Consistent with the pattern noted above with statistical significance of the changes, there were fewer participants demonstrating reliable change on the McGill Pain Questionnaire than the Brief Pain Inventory. An examination of scores on the Sensory subscale of the McGill Pain Questionnaire showed that 59% had at least moderate effects, with nearly 30% of the sample obtaining large effects at post-treatment. Nearly identical outcomes were found at 3 months with 60% obtaining moderate effects, and 30% of the sample obtaining large effects. Slightly less individual change was found for the Affective subscale. At post-treatment, 51% showed at least moderate effects, with 22% of the sample obtaining large effects. This level of improvement was maintained at 3 months with 50% showing at least moderate effects, and 17% of the sample obtaining large effects.

There was substantial improvement in pain acceptance at both follow-up assessments. At post-treatment, 74% showed at least moderate effects, with 41% of the sample obtaining large effects. At 3 months, 74% showed at least moderate effects with 45% of the sample obtaining large effects.

Comparable effects were found for the measures of emotional functioning as with the pain-related measures. On the depression measure, 76% of the participants showed at least moderate effects at post-treatment, with 58% of the sample obtaining large effects. Similarly substantial effects were noted at 3 months as well with 77% showing at least moderate effects. Of the participants, 37% obtained large effects. Regarding general levels of emotional distress, 77% showed at least moderate effects at post-treatment, with nearly half of the sample (46%) obtaining large effects. At 3 months, 68% still showed at least moderate effects with approximately 1/3 of the participants (32%) obtaining large effects. On a measure of unresolved stress symptoms, 71% showed at least moderate effects with 53% of the sample obtaining large effects. These effects were slightly better at 3 months with 77% showing at least moderate effects and 57% obtaining large effects.

Also similarly to the patterns on the t-tests and effect sizes, there were fewer positive responses for satisfaction with life than for the other outcome measures. . At post-treatment, 45% showed at least moderate effects with 13% of the participants obtaining large effects. At the 3 month follow-up, 47% showed at least moderate effects with 20% of the sample at this point obtaining large effects.

Table 2. Reliable Change Index

	No Effect *n* (%)	Moderate (but not large) Effect *n* (%)	Large Effect *n* (%)
BPI Pain			
Post-treatment (N = 38)	5 (13.2)	8 (21.1%)	25 (65.8)
3-month (N = 30)	5 (16.7)	7 (23.3%)	18 (60.0)
BPI Disability			
Post-treatment (N = 38)	7 (18.4)	6 (15.8)	25 (65.8)
3-month (N = 30)	6 (20.0)	9 (30.0)	15 (50.0)
MPQ Sensory Pain			
Post-treatment (N = 37)	15 (40.5)	11 (29.7)	11 (29.7)
3-month (N = 30)	12 (40.0)	9 (30.0)	9 (30.0)
MPQ Affective Pain			
Post-treatment (N = 37)	18 (48.6)	11 (29.7)	8 (21.6)
3-month (N = 30)	15 (50.0)	10 (33.3)	5 (16.7)
Pain Acceptance			
Post-treatment (N = 39)	10 (25.6)	13 (33.3)	16 (41.0)
3-month (N = 31)	8 (25.8)	9 (29.0)	14 (45.2)
Depression			
Post-treatment (N = 38)	9 (23.7)	7 (18.4)	22 (57.9)
3-month (N = 30)	7 (23.3)	12 (40.0)	11 (36.7)
General Emotional Symptoms			
Post-treatment (N = 39)	9 (23.1)	12 (30.8)	18 (46.2)
3-month (N = 31)	10 (32.3)	11 (35.5)	10 (32.3)
Unresolved Stress			
Post-treatment (N = 38)	11 (28.9)	7 (18.4)	20 (52.6)
3-month (N = 30)	7 (23.3)	6 (20.0)	17 (56.7)
Satisfaction with Life			
Post-treatment (N = 38)	21 (55.3)	12 (31.6)	5 (13.2)
3-month (N = 30)	16 (53.3)	8 (26.7)	6 (20.0)

Note. Large effect = cut off of 1.96; Moderate effect = .50.

Predicting changes in outcome

Correlations among the predictor variables. The correlations among the predictor variables are presented in Table 3. An examination of the correlation matrix reveals several domains of predictor variables. With the exception of a couple of scattered significant correlations, depression, the two stress items, and attitudes toward treatment each represent a separate predictor domain, whereas the emotion regulation measures (alexithymia, ambivalence over emotional expression, levels of emotional awareness, and communicating thoughts and feelings questionnaire) represent another domain of predictors. Aside from the very high correlations among the difficulty identifying feelings,

the difficulty describing feelings subscales and the total alexithymia score, the majority of the correlations do not suggest any redundant measures.

Table 3. Intercorrelations among predictor variables

	CESD	TAS20	DIF	DDF	EOT	AEQ	LEAS	CTF-A	CTF-V	LSCRsum	LSCRdis	TASpre
CESD		.27	.34	.20	.09	.41	.16	-.08	-.20	-.07	.26	-.26
TAS20			.87	.87	.69	.69	-.31	-.48	-.44	-.05	.29	-.07
DIF				.70	.36	.75	-.09	-.34	-.43	.13	.33	-.01
DDF					.43	.65	-.37	-.48	-.30	-.13	.17	-.13
EOT						.21	-.34	-.36	-.37	-.15	.17	-.04
AEQ							-.15	-.52	-.36	.10	.38	-.14
LEAS								.28	.20	.44	.22	.19
CTFQ-A									.48	-.17	-.23	.32
CTFQ-V										.01	-.12	.29
LSCRsum											.31	.04
LSCRdis												.04

Note. CESD = Center for Epidemiological Studies-Depression; TAS20 = Toronto Alexithymia Scale total score; DIF = TAS20 Difficulty Identifying Feelings; DDF = TAS20 Difficulty Describing Feelings; EOT = TAS20 Externally Oriented Thinking; AEQ = Ambivalence Over Emotional Expression; LEAS = Levels of Emotional Awareness Scale; CTF-A = Communicating Thoughts and Feelings Questionnaire Assertive Subscale; V = Vulnerability Subscale; LSCRsum = Life Stressor Checklist Revised Number of Stressful Life Events; LSCRdis = Average Distress Associated with Stressors; TASpre = Treatment Attitudes Survey
$p < .05$ when $r \geq \pm .30$; $p < .01$ when $r \geq \pm .37$

A series of partial correlations were used to explore the relationships between baseline measures of depression, emotion regulation, stress, and attitudes toward treatment, and the change scores for the outcome measures for both the post-treatment and the 3-month follow-up. The demographic variables of age and gender were associated with some of the predictor variables. Thus, these correlations were controlled for age and gender to eliminate any potential confounds of these relationships.

Baseline Depression

Partial correlations were examined between baseline levels of depression and change in the outcome measures. Overall, baseline depression was a significant predictor of change in outcome across several domains, and these values are presented in Table 4. First, with respect to pain-related outcome measures, depression failed to predict changes in pain as measured by the Brief Pain Inventory at either time point; however, it predicted change in both the sensory and affective subscales of the McGill Pain Questionnaire at the post-treatment assessment. Specifically, greater depression at baseline significantly predicted a greater reduction in the affective dimension of pain and marginally did so in the sensory dimension of pain. This relationship was not maintained at the 3-month follow up. Regarding pain-related disability, greater baseline depression significantly predicted a greater reduction in disability at post-treatment and marginally did so at 3 months. Finally, baseline depression failed to predict changes in pain acceptance at both time points.

With respect to the prediction of changes in emotional functioning, baseline depression was, not surprisingly, related to change in depression and general emotional distress. Specifically, greater depression at baseline significantly predicted more improvement in depression at both post-treatment and 3 months, whereas it predicted more improvement in general levels of emotional distress only at post-treatment. Greater baseline depression also predicted a greater reduction in unresolved stress symptoms at post-treatment but not at the 3-month follow-up. Finally regarding satisfaction with life, greater baseline depression predicted more satisfaction with life at post-treatment. This relationship was not maintained at 3 months.

Table 4. Partial correlations (controlling for gender and age) between baseline depression and changes in outcome measures (post minus pre)

	Depression
Pain	
Post-treatment (*n* = 38)	-.19
3-month (*n* = 30)	-.30
Pain-related Disability	
Post-treatment (*n* = 38)	**-.32**†
3-month (*n* = 30)	**-.40***
Sensory Pain	
Post-treatment (*n* = 37)	**-.33**†
3-month (*n* = 30)	-.17
Affective Pain	
Post-treatment (*n* = 37)	**-.50****
3-month (*n* = 30)	-.21
Pain Acceptance	
Post-treatment (*n* = 39)	.13
3-month (*n* = 31)	.19
Depression	
Post-treatment (*n* = 38)	**-.68****
3-month (*n* = 30)	**-.48****
General Emotional Distress	
Post-treatment (*n* = 39)	**-.53****
3-month (*n* = 31)	-.28
Unresolved Stress Symptoms	
Post-treatment (*n* = 38)	**-.34***
3-month (*n* = 30)	-.06
Satisfaction with Life	
Post-treatment (*n* = 38)	**.37***
3-month (*n* = 30)	.15

Note. $^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$

Baseline levels of stress

Stress at baseline demonstrated predictive ability of change in outcome measures across domains. These values are presented in Table 5. Greater levels of distress associated with stressful life events at baseline marginally predicted less improvement in pain-related disability at post-treatment but not at the 3-month follow-up. In contrast, greater levels of distress at baseline significantly predicted more reduction in affective dimensions of pain at post-treatment, and number of stressful life events at baseline marginally predicted more improvement in chronic pain acceptance at post-

treatment. Similarly, both greater number of stressful life events and greater distress associated with stressful life events at baseline significantly predicted more reduction in unresolved stress symptoms at post-treatment. At 3 months, only number of stressful life events remained a significant predictor. Baseline levels of stress failed to predict changes in pain on the BPI, depression, general emotional distress, and satisfaction with life.

Table 5. Partial correlations (controlling for gender and age) between baseline levels of stress and changes in outcome measures

	Stress	
	Number of Stressful Life Events	Associated Distress
Pain		
Post-treatment (*n* = 38)	-.04	.11
3-month (*n* = 30)	.05	.18
Pain-related Disability		
Post-treatment (*n* = 38)	.02	**.30**†
3-month (*n* = 30)	.21	.26
Sensory Pain		
Post-treatment (*n* = 37)	-.09	-.24
3-month (*n* = 30)	.01	-.02
Affective Pain		
Post-treatment (*n* = 37)	-.08	**-.40***
3-month (*n* = 30)	-.11	-.29
Pain Acceptance		
Post-treatment (*n* = 39)	**.28**†	.27
3-month (*n* = 31)	.12	.12
Depression		
Post-treatment (*n* = 38)	.01	.03
3-month (*n* = 30)	-.09	.09
General Emotional Distress		
Post-treatment (*n* = 39)	-.15	-.11
3-month (*n* = 31)	-.12	.08
Unresolved Stress Symptoms		
Post-treatment (*n* = 38)	**-.36***	**-.44****
3-month (*n* = 30)	**-.47***	-.32
Satisfaction with Life		
Post-treatment (*n* = 38)	.25	.11
3-month (*n* = 30)	.28	-.02

Note. $^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$

Alexithymia

The total score of alexithymia, along with the separate subscales, demonstrated some predictive validity with respect to change in the outcome measures. These values are presented in Table 6. Overall, alexithymia failed to predict changes in pain as measured by both the BPI and the MPQ. However, greater baseline levels of the difficulty identifying feelings subscale marginally predicted less improvement in pain on the BPI at 3 months. In contrast, greater baseline levels of the difficulty describing feelings subscale marginally predicted more improvement in the affective dimension of pain on the MPQ at post-treatment. Alexithymia failed to predict changes in pain-related disability. Finally for the pain-related measures, greater levels of alexithymia at baseline marginally predicted more improvement in chronic pain acceptance at post-treatment. Examining the predictive ability of the alexithymia subscales reveals that, specifically, greater levels of the difficulty identifying feelings subscale significantly predicted more improvement in pain acceptance. Interestingly, while greater levels of difficulty identifying feelings predicted less improvement in pain on a 1-10 scale, it predicted more improvement in chronic pain acceptance.

With respect to the outcome measures of emotional functioning, baseline levels of alexithymia failed to predict changes in depression and general emotional distress at both time points. However, greater levels of alexithymia at baseline significantly predicted a greater reduction in unresolved stress symptoms at post-treatment. Both the difficulty identifying feelings and the difficulty describing feelings subscales significantly predicted this change. At the 3-month follow-up, only the difficulty identifying feelings subscale significantly predicted a greater reduction in unresolved stress symptoms, and

the difficulty describing feelings subscale marginally did so. On the final measure, satisfaction with life, there was only one marginally significant prediction found between the difficulty describing feelings subscale of alexithymia and satisfaction with life. Specifically, greater levels of difficulty describing feelings marginally predicted less improvement in satisfaction at the 3-month follow-up. The externally oriented thinking subscale of alexithymia failed to predict any changes in outcome.

Table 6. Partial correlations (controlling for gender and age) between baseline alexithymia and changes in outcome measures

	Alexithymia			
	Total Alexithymia	Difficulty Identifying Feelings	Difficulty Describing Feelings	Externally Oriented Thinking
Pain				
Post-treatment (*n* = 38)	.18	.22	.08	.13
3-month (*n* = 30)	.20	**.33**†	.04	.08
Pain-related Disability				
Post-treatment (*n* = 38)	.22	.24	.12	.16
3-month (*n* = 30)	.14	.27	-.10	.17
Sensory Pain				
Post-treatment (*n* = 37)	-.20	-.11	-.21	-.18
3-month (*n* = 30)	.05	.12	-.11	.13
Affective Pain				
Post-treatment (*n* = 37)	-.23	-.23	**-.32**†	.04
3-month (*n* = 30)	-.11	-.18	-.24	.24
Pain Acceptance				
Post-treatment (*n* = 39)	**.28**†	**.36***	.17	.12
3-month (*n* = 31)	.10	.06	.21	-.06
Depression				
Post-treatment (*n* = 38)	.04	-.03	.01	.13
3-month (*n* = 30)	.21	.19	.13	.17
General Emotional Distress				
Post-treatment (*n* = 39)	-.14	-.23	-.17	.10
3-month (*n* = 31)	-.11	-.10	-.27	.16
Unresolved Stress Symptoms				
Post-treatment (*n* = 38)	**-.41***	**-.55****	**-.41**†	.02
3-month (*n* = 30)	-.31	**-.53****	**-.33**†	.20
Satisfaction with Life				
Post-treatment (*n* = 38)	-.03	.02	-.16	.09
3-month (*n* = 30)	-.28	-.25	**-.35**†	.01

Note. $^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$

Ambivalence over Emotional Expression

In general, ambivalence over emotional expression demonstrated predictive ability across the domains of outcome measures. These values are presented in Table 7. With respect to the Brief Pain Inventory, baseline ambivalence failed to predict changes in pain and pain-related disability. However, greater baseline levels of ambivalence about expressing emotions significantly predicted greater reductions in both sensory and affective dimensions of pain at post-treatment and a greater reduction in the affective dimension of pain at 3 months. Additionally, greater levels of baseline ambivalence significantly predicted more improvement in chronic pain acceptance at post-treatment but not at 3 months.

With respect to the measures of emotional functioning, ambivalence over emotional expression failed to predict changes in depression at follow-up. Greater levels of ambivalence at baseline significantly predicted more improvement in general emotional distress symptoms at post-treatment and marginally so at 3 months. It also significantly predicted a greater reduction in unresolved stress symptoms at both time points. Finally, ambivalence over expressing emotions failed to predict changes in satisfaction with life.

Table 7. Partial correlations (controlling for gender and age) between baseline ambivalence over emotional expression and changes in outcome measures

	Ambivalence Over Emotional Expression
Pain	
Post-treatment (*n* = 38)	.03
3-month (*n* = 30)	.25
Pain-related Disability	
Post-treatment (*n* = 38)	.15
3-month (*n* = 30)	.14
Sensory Pain	
Post-treatment (*n* = 37)	**-.43***
3-month (*n* = 30)	-.19
Affective Pain	
Post-treatment (*n* = 37)	**-.53****
3-month (*n* = 30)	**-.43***
Pain Acceptance	
Post-treatment (*n* = 39)	**.36***
3-month (*n* = 31)	.17
Depression	
Post-treatment (*n* = 38)	.12
3-month (*n* = 30)	-.07
General Emotional Distress	
Post-treatment (*n* = 39)	**-.42***
3-month (*n* = 31)	**-.32**†**
Unresolved Stress Symptoms	
Post-treatment (*n* = 38)	**-.54****
3-month (*n* = 30)	**-.51****
Satisfaction with Life	
Post-treatment (*n* = 38)	.00
3-month (*n* = 30)	-.17

Note. †$p < .10$. *$p < .05$. **$p < .01$

Levels of Emotional Awareness

Baseline levels of emotional awareness only demonstrated predictive ability on two measures. These values are presented in Table 8. It failed to predict changes in any of the pain-related measures, depression, and general emotional distress. Greater levels of emotional awareness at baseline marginally predicted a greater reduction in unresolved stress symptoms at the 3-month follow-up. There was also a marginally significant prediction found between emotional awareness and satisfaction with life.

Greater levels of emotional awareness marginally predicted more satisfaction at both post-treatment and 3 months.

Table 8. Partial correlations (controlling for gender and age) between baseline levels of emotional awareness and changes in outcome measures

	Levels of Emotional Awareness
Pain	
Post-treatment (*n* = 38)	.05
3-month (*n* = 30)	-.10
Pain-related Disability	
Post-treatment (*n* = 38)	.08
3-month (*n* = 30)	.07
Sensory Pain	
Post-treatment (*n* = 37)	.24
3-month (*n* = 30)	-.02
Affective Pain	
Post-treatment (*n* = 37)	.26
3-month (*n* = 30)	.08
Pain Acceptance	
Post-treatment (*n* = 39)	.18
3-month (*n* = 31)	.08
Depression	
Post-treatment (*n* = 38)	.11
3-month (*n* = 30)	-.12
General Emotional Distress	
Post-treatment (*n* = 39)	-.01
3-month (*n* = 31)	-.11
Unresolved Stress Symptoms	
Post-treatment (*n* = 38)	.05
3-month (*n* = 30)	**-.36**†
Satisfaction with Life	
Post-treatment (*n* = 38)	**.28**†
3-month (*n* = 30)	**.31**†

Note. $^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$

Communicating Thoughts and Feelings

The Communicating Thoughts and Feelings Questionnaire also only demonstrated predictive ability of change in two measures. These values are presented in Table 9. Both the assertive and the vulnerability subscales failed to predict changes in pain and pain-related disability on the BPI along with changes in chronic pain acceptance. On the MPQ, greater baseline levels of assertive ability in communicating

thoughts and feelings marginally predicted less improvement in the sensory dimension of pain at post-treatment. Thus, surprisingly, participants who rated themselves as more assertive at baseline actually reported marginally more sensory pain at outcome than those who rated themselves as less assertive. A similar prediction was found for unresolved stress symptoms. Greater levels of assertive ability at baseline significantly predicted less reduction in unresolved stress symptoms at post-treatment, and greater levels of ability communicating vulnerable thoughts and feelings marginally predicted less reduction in unresolved stress symptoms at post-treatment. These relationships were not maintained at 3 months. Communicating thoughts and feelings failed to predict changes in depression, general emotional distress, and satisfaction with life.

Table 9. Partial correlations (controlling for gender and age) between baseline levels of communicating thoughts and feelings and changes in outcome measures

	Communicating Thoughts and Feelings	
	Assertive	Vulnerability
Pain		
Post-treatment (*n* = 38)	-.05	-.14
3-month (*n* = 30)	-.26	-.17
Pain-related Disability		
Post-treatment (*n* = 38)	.02	-.02
3-month (*n* = 30)	-.22	-.21
Sensory Pain		
Post-treatment (*n* = 37)	**.34**†	.16
3-month (*n* = 30)	-.02	-.05
Affective Pain		
Post-treatment (*n* = 37)	.17	-.12
3-month (*n* = 30)	.08	-.18
Pain Acceptance		
Post-treatment (*n* = 39)	-.16	-.07
3-month (*n* = 31)	-.04	-.05
Depression		
Post-treatment (*n* = 38)	.12	.00
3-month (*n* = 30)	.09	.07
General Emotional Distress		
Post-treatment (*n* = 39)	.22	.21
3-month (*n* = 31)	.20	.16
Unresolved Stress Symptoms		
Post-treatment (*n* = 38)	**.40***	**.35**†
3-month (*n* = 30)	.20	.27
Satisfaction with Life		
Post-treatment (*n* = 38)	-.04	-.28
3-month (*n* = 30)	-.10	-.21

Note. $^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$

Attitudes Toward Treatment

The measure of attitudes toward treatment was predictive of change in only one outcome measure. These values are presented in Table 10. Greater levels of positive feelings toward the treatment marginally predicted more improvement in chronic pain acceptance at post-treatment, but not at the 3-month follow-up. Attitudes toward treatment failed to predict changes in pain, pain-related disability, measures of emotion functioning, and satisfaction with life.

Table 10. Partial correlations (controlling for gender and age) between baseline attitudes toward treatment and changes in outcome measures

	Attitudes Toward Treatment
Pain	
Post-treatment (*n* = 38)	-.27
3-month (*n* = 30)	-.15
Pain-related Disability	
Post-treatment (*n* = 38)	-.00
3-month (*n* = 30)	.06
Sensory Pain	
Post-treatment (*n* = 37)	.08
3-month (*n* = 30)	.06
Affective Pain	
Post-treatment (*n* = 37)	.13
3-month (*n* = 30)	-.03
Pain Acceptance	
Post-treatment (*n* = 39)	**.32**†
3-month (*n* = 31)	.09
Depression	
Post-treatment (*n* = 38)	.14
3-month (*n* = 30)	.24
General Emotional Distress	
Post-treatment (*n* = 39)	.07
3-month (*n* = 31)	.19
Unresolved Stress Symptoms	
Post-treatment (*n* = 38)	.12
3-month (*n* = 30)	-.03
Satisfaction with Life	
Post-treatment (*n* = 38)	.11
3-month (*n* = 30)	.05

Note. $^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$

Evaluating effects of emotional assessment on outcome

The demographic and baseline variables were examined to determine any differences between the participants who received the novel emotional communication assessment and those did not receive the assessment. There were no significant differences between the groups on age, gender, and ethnicity, although age showed some trend of difference between the two groups, $F(1, 43) = 1.78$, $p = .19$. Those who received the assessment were slightly older than those who did not. See Table 11 for

the demographics of each group. There were also no significant differences between groups on the baseline outcome measures. These analyses are presented in Table 12.

A series of ANCOVA's were conducted to determine whether the participants who received the novel emotional communication assessment had greater improvement on the outcome measures than participants who did not receive the assessment. Group was used as the independent variable, and the change scores at post-treatment and 3-months were used as the dependent variable. Because age was slightly significantly different between the two groups it was entered as a covariate for these analyses. These analyses were conducted separately for the post-treatment and 3-month follow-up assessments. At post-treatment and at the 3-month follow-up, the ANCOVA's revealed no significant differences between the two groups. There was one trend for significance in the opposite direction than hypothesized for satisfaction with life at 3 months. Participants in the group receiving the novel assessment tended to report less satisfaction with life than the participants who did not receive the assessment, $F(1, 27) = 3.48$, $p = .07$. The complete results of the baseline, post-treatment, and 3-month follow-up data and the ANCOVAs are presented in Table 12.

Table 11. Comparison of Demographic Variables Between Those Who Received The Emotion Assessment and Those Who Did Not.

		Assessment (n =22)	No Assessment (n = 24)	F/χ^2	p
Age (years)	M (SD)	54.29 (14.60)	48.09 (16.06)	1.78	.19
Gender					
Female	n (%)	17 (77.27%)	18 (75.00%)	.03	.86
Male	n (%)	5 (22.72%)	6 (25.00%)		
Ethnicity					
Caucasian	n (%)	19 (90.48%)	23 (95.83%)	.52	.47
African American	n (%)	0 (0.00%)	1 (4.17%)		
Middle Eastern	n (%)	1 (4.76%)	0 (0.00%)		
Unknown	n (%)	1 (4.76%)	0 (0.00%)		

Note. Chi-square analysis for ethnicity was analyzed comparing Caucasian to the other ethnicities combined due to the small numbers in the other cells.

Table 12. Baseline, Post-treatment, and Follow-up Data and Analyses of Change by Group.

	Assessment			No Assessment			*F*	*p*
	n	M (SD)	Change Score	n	M (SD)	Change Score		
BPI Pain								
Baseline	21	5.35 (2.07)		24	5.23 (1.91)		.04	.85
Post-treatment	19	3.16 (1.81)	-2.19	20	3.21 (1.91)	-2.02	.21	.65
3-month	15	3.49 (1.93)	-1.86	16	2.72 (1.68	-2.51	.03	.87
BPI Disability								
Baseline	21	5.92 (2.20)		24	5.60 (2.23)		.23	.63
Post-treatment	19	3.11 (2.04)	-2.81	20	2.93 (2.46)	-2.67	.16	.69
3-month	15	3.85 (2.68)	-2.07	16	2.40 (1.62)	-3.20	.04	.84
MPQ Sensory Pain								
Baseline	22	10.40 (7.10)		23	9.90 (5.68)		.07	.80
Post-treatment	18	5.79 (6.34)	-4.61	20	5.15 (4.42)	-4.75	.31	.58
3-month	15	8.11 (5.19)	-2.29	16	4.46 (3.61)	-5.44	.48	.50
MPQ Affective Pain								
Baseline	22	4.50 (3.76)		23	3.65 (2.92)		.72	.40
Post-treatment	18	1.22 (1.26)	-3.28	20	1.60 (1.85)	-2.05	.69	.41
3-month	15	2.73 (3.13)	-1.77	16	1.56 (2.28)	-2.09	.03	.86
Pain Acceptance								
Baseline	22	50.68 (17.39)		24	46.25 (16.78)		.77	.38
Post-treatment	19	64.47 (18.76)	13.79	20	63.35 (18.84)	17.10	.46	.50
3-month	15	63.20 (18.74)	12.52	16	68.13 (17.45)	21.88	.60	.45
Depression								
Baseline	21	27.35 (12.15)		24	27.72 (12.42)		.01	.92
Post-treatment	19	14.26 (9.83)	-13.09	20	15.10 (11.88)	-12.62	.01	.91
3-month	15	22.74 (12.83)	-4.61	16	13.50 (11.81)	-14.22	2.19	.15
General Emotional Distress								
Baseline	22	59.10 (32.88)		24	57.54 (30.39)		.03	.87
Post-treatment	19	33.93 (26.01)	-25.17	20	32.42 (27.53)	-25.12	.23	.64
3-month	15	51.33 (43.94)	-7.77	16	39.06 (39.66)	-18.48	.11	.74
Unresolved Stress								
Baseline	22	29.43 (19.46)		24	29.38 (17.06)		.00	.99
Post-treatment	19	13.47 (8.11)	-15.96	19	15.89 (12.03)	-13.49	.42	.52
3-month	14	18.43 (15.23)	-11.00	16	11.69 (9.49)	-17.69	.03	.87
Satisfaction with Life								
Baseline	21	3.13 (1.53)		24	3.08 (1.40)		.02	.90
Post-treatment	19	3.69 (1.65)	0.56	20	4.15 (1.45)	1.07	2.43	.13
3-month	15	3.12 (1.44)	-0.01	16	4.34 (1.50)	1.26	3.48	.07

Chapter 4

Discussion

This study sought to extend the literature on the effects of emotion-focused treatments for chronic pain by examining a four session group treatment that utilizes emotionally oriented techniques to treat pain. This study had three goals. First, it tested the hypothesis that this treatment would be effective by examining the pattern, magnitude, and reliability of change from baseline to post-treatment and 3-month follow-up on pain, pain-related disability, pain acceptance, emotional functioning (depression and general emotional distress), and satisfaction with life. Second, the study examined the ability of baseline measures of depression, stress, emotion regulation ability, and treatment attitudes to predict outcome of the treatment. Finally, this study included a novel emotional assessment that examined the participants' ability to communicate thoughts and feelings. It was hypothesized that participants who received this emotional assessment would report more improvement on the outcome measures than the participants who did not receive this assessment.

Estimating Changes in Outcome

To determine the effects of the intervention on the outcome measures of pain, pain-related disability, pain acceptance, emotional functioning, and satisfaction with life, several sets of analyses were conducted. These analyses, in general, indicated that this intervention led not only the statistically significant but clinically meaningful improvements in the outcome measures. First, paired-samples t-tests demonstrated that the mean scores of the outcome variables were statistically improved from the baseline values at both post-treatment and the 3-month follow-up assessment. Thus,

this intervention “works” in the sense that there was improvement, on average, among the patients.

More important than demonstrating that the effects are reliably different than zero, is estimating the magnitude of the effect of the intervention. Across measures, the sample’s improvement across time ranged from 0.39 to 1.42 standard deviations from baseline to post-treatment and a 3-month follow-up. These effects range from small-moderate to very large. This large variation in effect size may be due in part to the variability of domains of functioning assessed. Overall, the most improvements were found in the domain of pain, pain-related disability, and chronic pain acceptance, with improvements ranging from 0.62 to 1.42 standard deviations from baseline to post-treatment and the 3-month follow-up. Both the pain and the disability subscales of the Brief Pain Inventory demonstrated over 1 standard deviation improvement from baseline to post-treatment and the 3-month follow-up assessment.

Interestingly, the sensory and affective dimensions of pain did not demonstrate as large of an improvement (.62 - .78 SDs). Even though both of these measures assess perception of pain, they actually assess different elements of pain. The BPI requires participants to rate their pain on a 0-10 scale with 10 indicating the greatest level of pain whereas the MPQ requires participants to rate how much various sensory and affective adjectives describe their pain. Overall pain intensity decreased as demonstrated by decreased ratings on the 0-10 scale. Yet, participants still reported experiencing pain at the post-treatment and 3-month follow-up, thus, they still rated some of the pain adjectives as descriptive of their pain, importantly, with less intensity.

Finally, in regard to the pain domain, large effects were demonstrated in pain-related functioning. First, participants reported over 1 SD improvement at both post-treatment and the 3-month follow-up on pain-related disability. Participants reported substantial improvement for interference from pain in the areas of general activity, mood, mobility, and normal work levels at follow-up than at baseline. Additionally, participants reported large improvements at both follow-up assessments in their level of pain acceptance, which includes an acceptance of experiencing chronic pain along with a willingness to engage in activities regardless of pain experience.

These large improvements in pain and pain-related functioning are even more impressive when considering the brief nature of this treatment. One would not expect such significant benefits following only four sessions of a group format. Even though this is an uncontrolled study, this level of pain improvement would not be expected to happen on its own, with simply the passage of time. Moreover, comparing the effects of this intervention to the benefits noted for pain in other psychological treatments of pain reinforces the effectiveness of this treatment. Many studies do not find such substantial improvement in pain. Keefe, Caldwell, Williams, and Gill (1990) reported a median effect size of 0.50 of cognitive-behavioral treatments, but many of the studies examining CBT show even smaller effects with significantly less improvement noted at later follow-ups as compared to post-treatment effects. Studies of written emotional disclosure show modest benefits at best for pain with many of these studies demonstrating small effects for pain and other medical conditions (Broderick et al. 2005; Frisina et al. 2004; Gillis et al. 2006 Meads et al. 2003). Lumley and colleagues (2008) evaluated an emotional exposure based treatment for patients with fibromyalgia and found small to moderate

effects on the sensory and affective domains of pain at post-treatment and a 3-month follow-up. Thus, the moderate to large and large effect sizes found for pain in this emotion focused treatment at both post-treatment and at a 3-month follow-up are extremely note worthy.

Moderate to large improvements were also found for measures of emotional functioning. With the exception of the 3-month effect for general emotional distress (d = .47), improvement for measures of depression, general distress, and unresolved stress symptoms ranged from approximately 0.75 standard deviation to just over 1 standard deviation from baseline to post-treatment and a 3 month follow-up. Even though these effects are not quite as large as the improvements in pain, they are still substantial improvements. Particularly noteworthy are the large effects found in depression and the somewhat smaller effects in unresolved stress symptoms, even three months following this short-term group treatment. These results are partially expected because these are the symptoms targeted by this intervention. A key part of the treatment involves expressing emotions and processing unresolved stressful experiences through writing. Additionally, it uses mindfulness techniques to guide acceptance of emotions and thoughts as normal and not harmful and reengaging in previously avoided activity scheduling to help patients re-engage with life. These techniques serve to counter the avoidance of stressful thoughts and emotions that are hypothesized to relate to chronic pain.

It is important to note that even though the effect size for depression remained large at the 3-month follow-up and was nearly a medium effect for general emotional distress at 3 months, these measures had the largest reduction in improvement between post-

treatment and the 3-month follow-up. It is not surprising that some of the substantial treatment gains noted immediately after this brief treatment would be reduced somewhat after several months. With the exception of chronic pain acceptance and unresolved stress symptoms, which increased slightly in effect size, slight decreases are found across the measures. However, regarding depression and general emotional distress, it may be that some patients had diagnosable depressive and/or anxiety disorders that would not be expected to remit after 4 sessions of group treatment.

Surprisingly, the least improvement was found for satisfaction with life, which was a small to moderate effect at both post-treatment and 3 months. Given the substantial improvements in pain and pain-related disability along with depression and stress symptoms, one would expect greater improvements life satisfaction than what the participants reported at the follow-up assessments. It may be that even though the participants demonstrated improved depression, they still are experiencing a significant level of depression. An examination of the average depression scores shows that, in general, this sample was very depressed at baseline. Thus, even after substantial improvement (baseline mean = 27.69; post-treatment mean = 15.00; 3-month follow-up mean = 18.31), participants are still reporting levels of depression just under the cut-off for this measure at post-treatment and just over the cut-off at the 3-month follow-up. Additionally, many of these participants have been dealing with chronic pain for years and may have more of a negative outlook on life. They may still fear that the improvements in the pain-related domains are temporary and have not yet made many changes in their lives. Furthermore, similarly to the remaining symptoms of depression, pain improved substantially but not completely (baseline mean = 5.49; post-treatment

mean = 3.18; 3-month mean = 3.03). Some of the participants may only think that a complete cessation of pain is successful. As long as they are still experiencing pain, life is not as satisfying as it could be. In addition, quality of life is not just thought of as the inverse of negative states such as depression or pain. With the consideration of life satisfaction as partially independent from the other outcomes, it may be that the patients are experiencing reduced symptoms but still are not reporting the addition of many positive elements in their lives. Life satisfaction may require positive developments in sense of self, relationships, and meeting life's goals.

Finally, in addition to estimating change across the sample, this study examined the number of individual patients who show a clinically meaningful positive change after completing the treatment. A similar pattern of change was found when looking at individual change as with the range found on the group effect sizes. The percentage of individual patients demonstrating a reliably large effect ranged from 13% to 66%. The highest prevalence of clinically significant responders was found on pain and pain-related disability rated on a 0-10 scale. Nearly 2/3 of the sample had a large effect (less than 5% probability that the change is due to chance) at post-treatment for both of these outcomes. At the 3-month follow-up, 60% of the sample still had a large effect on this measure of pain, and half of the sample still had a large effect for pain-related disability. When using a less stringent cut-off to identify a moderate effect, the level of individual change was even more impressive. Over 80% of the sample had at least a moderate effect for pain at both follow-ups and approximately 80% had at least a moderate effect on pain-related disability. These high percentages suggest that the clinically meaningful improvements in pain and pain-related disability occurred for the majority of the sample

which is much higher than the 1/3 of patients Turk (2005) found improved on average with cognitive-behavioral treatments for pain. Chronic pain acceptance was a similarly robust change across both time points. Almost half of the sample had a large effect at the 3-month follow-up. Including the moderate effect, ¾ of the sample demonstrated clinically meaningful improvements in pain acceptance. Lower rates of improvement were found on the sensory and affective dimensions of pain, which is consistent with the lower effect size noted for the group overall, and again suggests that this manner of measuring pain differs from the 0 to 10 rating scale of pain intensity.

Regarding the measures of emotional functioning, with the exception of the unresolved stress symptoms, more individuals showed improvements at the post-treatment than at the 3-month follow-up (depression and general emotional distress). This reduction in the number of responders at the further follow-up assessment provides further support for the possibility discussed above that a subset of the patients were clinically depressed or anxious and may have experienced a short-term significant benefit from these symptoms. Yet, it is also possible that since 3 months has passed since the patients' last assessment, that some of them have experienced stressful events and become more depressed or anxious. Over half of the participants had a large effect for unresolved stress symptoms and nearly ¾ of the sample demonstrated a moderate effect at both time points. As discussed previously, this improvement is partially expected given the treatment's emphasis on processing stressful experiences.

As with the previous analyses, the lowest prevalence of clinically significant responders was found for satisfaction with life. Approximately half of the sample demonstrated at least a moderate effect, but half of the sample did not demonstrate

moderate improvement on this outcome. Thus, with the exception of life satisfaction, the impressive prevalence of individual change on the primary outcomes of pain, depression, and unresolved stress symptoms provides even more support for the effectiveness of this treatment.

Predicting changes in outcome

The second goal of the study was to identify variables at baseline that predict how patients will respond to the treatment. All of the hypothesized predictor variables demonstrated some predictive ability. In general, participants with greater levels of depression, stress, and discomfort with emotions at baseline improved the most. However, there are several caveats. Many of the predictions were significant only at post-treatment and not at the 3-month assessment, several of the baseline measures predicted change in only a few outcomes, and some of the outcomes, such as improvements in pain, were not predicted by any of the baseline measures.

First, depression demonstrated strong predictive validity at the post-treatment assessment. Participants who reported greater depression at baseline reported greater improvements in pain-related disability, the sensory and affective dimensions of pain, depression, general emotional functioning, unresolved stress symptoms, and satisfaction with life at post-treatment. At 3 months, baseline depression significantly predicted only improvement in depression and marginally predicted improvement in pain-related disability. These results are consistent with one study that found high levels of negative affect at baseline to predict better outcomes of written emotional disclosure (Norman et al., 2004). There are a couple of possibilities regarding the loss of predictive power at 3 months. First, after examining the partial correlations, a couple of the

correlations between depression and the outcome measures may have been significant with a large sample size (pain, general emotional distress). However, this is not true for all of the correlations. Thus, another possibility is that because the overall effects of the treatment are lower at the 3-month follow-up, there is less change to predict than at post-treatment. Alternatively, it may be important to consider other factors that may influence long-term benefits of this treatment. The patients may have made changes in their lives that account for the improvements noted at 3 months more so than baseline levels of depression before the treatment.

Second, stress predicted change in outcome for several domains of functioning. For the most part, greater stress at baseline predicted improvement in the affective dimension of pain, chronic pain acceptance, and unresolved stress symptoms. Only the prediction for unresolved stress symptoms was maintained at 3 months. It makes sense that participants with more stressful experiences to process benefitted from the writing and meditation exercises. Surprisingly, greater distress associated with stressful life events at baseline actually predicted less improvement in pain-related disability at post-treatment. It is unclear why this prediction is in the opposite direction as the others with stress and depression. An examination of the correlations between stress and the outcome measures suggests that, in general, a larger sample size would likely provide enough power to maintain these predictions.

Third, an examination of the emotion regulation measures revealed variable and sometimes conflicting predictive ability of changes in outcome. Alexithymia as a total score predicted change only in unresolved stress symptoms. Greater alexithymia at baseline predicted improvement in unresolved stress symptoms at post-treatment and

marginally predicted improvement at 3 months. However, the subscales of difficulty identifying feelings and the difficulty describing feelings had variable results. Whereas greater levels of difficulty describing feelings at baseline predicted improvement in the affective dimension of pain at post-treatment, it predicted less improvement in satisfaction with life at 3 months. Also in contrast to the improvement in affective pain, greater levels of difficulty identifying feelings at baseline predicted less improvement in pain on a 0-10 scale at 3 months. It is unclear why the describing feelings and the identifying feelings components of alexithymia would predict a different direction in similar outcomes. Furthermore, it is interesting that participants reporting more difficulty identifying and describing emotions would have greater improvement in unresolved stress symptoms, yet still have less improvement in pain and satisfaction with life. These mixed results are consistent with much of the literature on alexithymia as it relates to health and psychological outcomes with several studies concluding that alexithymia predicts poorer outcome (Kelley et al., 1997; Posemato, 2008), yet other studies showing more benefits for alexithymic individuals (Baikie, 2008; Solano et al., 2003).

Regarding levels of emotional awareness, greater awareness at baseline marginally predicted improvement in unresolved stress symptoms at 3 months and in satisfaction with life at both time points. However, greater perceived ability to express assertive and vulnerable thoughts and feelings at baseline predicted less improvement in the sensory dimension of pain and unresolved stress symptoms at post-treatment. Thus, it is somewhat confusing that a greater awareness of emotions and being alexithymic at the same time led to a greater reduction in unresolved stress symptoms,

but a greater perceived ability to communicate emotions led to less reduction in stress symptoms.

Ambivalence over emotional expression yielded the most consistent predictive ability with greater baseline levels predicting improvements in pain acceptance at post-treatment, and improvements in the sensory and affective dimensions of pain, general emotional distress, and unresolved stress symptoms at both time points. These findings are consistent with another study that found that greater levels of ambivalence at baseline predicted improved outcomes following the emotion focused treatment of emotional disclosure (Norman et al., 2004). Overall, with respect to the emotion regulation predictors, it makes sense that difficulty identifying feelings or less awareness of emotional experience would interfere with the beneficial outcomes of this treatment. This is consistent with other research that examined lack of emotional awareness as a predictor of worse treatment outcome (Kelley et al., 1997; Lumley, Tojek, & Maclem, 2002). Participants may not be able to fully engage in the processing of emotions related to their stressful experiences. However, for those participants who generally have an awareness of their emotions but are ambivalent about expressing them or have difficulty expressing them, this treatment likely facilitated that process through writing exercises in a safe environment.

Finally, attitudes toward treatment at baseline did not demonstrate much predictive utility. In fact, greater positive feelings toward the treatment only marginally predicted improvement in chronic pain acceptance. The lack of findings for this predictor was surprising given that treatment expectancy and credibility are thought to be strong predictors of treatment outcome. The average rating for this scale was 2.68 on a 0-4

scale, suggesting that patients had positive expectations overall regarding the treatment, yet there was some variability on this measure. Thus, it is also possible that patients' ideas about the treatment when they do not fully understand the treatment lack validity for predicting outcome.

Depression and ambivalence over expressing emotions demonstrated the most predictive utility regarding who benefits most from this treatment. Even with these measures, most of the predictions were significant at post-treatment, with only marginal or no significance at 3 months. As discussed above, it is possible that the reduced sample size at the 3-month follow-up compared with the post-treatment assessment could account for these differences. There may not have been enough power to maintain the predictive ability at 3 months. The magnitude of some of the correlations suggests that the prediction may be maintained with a larger sample size. However, it is also possible that different factors account for the improvement at 3 months.

Evaluating effects of emotional assessment on outcome

The third hypothesis that the patients participating in the emotion communication exercise would report better outcomes at follow-up than those that did not complete the assessment was not supported. There are several possible explanations for the lack of group differences on outcomes. There may not be enough power to detect group differences with the small sample size in each group. The emotion assessment was brief and may not have been powerful enough to lead to better outcomes. The actual exercise only took approximately 10 minutes to complete. Furthermore, participants were not given feedback on their performance but rather were invited to explore how their performance in the exercise related to their life, stressors, relationships, and pain.

This exploration may not have been direct enough for the participants to make the connection between their experiences during the exercise and their past stressful experiences, emotions, and their current symptoms during the treatment sessions. Even though challenges in communicating the thoughts and feelings may have been uncovered during the exercise, participants may not have addressed these challenges during the treatment. It is also possible that this emotion exercise might be useful as an assessment tool but may not be as useful for treatment. Finn's (1996; 2003) work on therapeutic assessment, which this emotional assessment was partially based on, involves a more extensive exploration and feedback process. In contrast, the exercise in this study was only 10-15 minutes in length, and the exploration part was only several of those minutes. It may be relevant to help patients increase their awareness and expression of these emotions in preparation for treatment but with a more structured feedback process.

A surprising finding was that the participants who completed the emotion assessment actually reported marginally significantly worse outcomes on satisfaction with life at both time points. However, the reliability of these findings is unclear. There were no significant differences for the other measures. It does not make sense that the participants in this group would report similar symptoms at post-treatment and then worse outcomes three months later. Rather, this is likely explained by the smaller sample size at 3 months than at post-treatment. Analyses were completed before the full sample completed their 3-month follow-up. With their data included, it is likely that these differences will be nonsignificant.

Limitations

Many of the limitations of this study have been referenced above in relationship to the applicable hypotheses including lack of control group and small sample size. The initial goal of this study was to estimate the treatment's effectiveness. T-tests and effect sizes revealed that participants reported several large and moderate effects on most of the domains of functioning after completing the treatment. However, because this was an uncontrolled study, one cannot conclude that the treatment caused these improvements. Thus, it is possible that other factors were responsible for the improvements in functioning. The passage of time, attention of a caring professional, and expectations/beliefs that they should feel better could account for improvements in outcome. Furthermore, since all of the outcomes are self-report measures, there are demand effects on the outcomes. However, as discussed above, it is unlikely that these factors alone would contribute to this level of improvement given the nature of chronic pain, which rarely alleviates on its own in such a short period of time and has not typically found to improve this much in previous studies of chronic pain treatment. The lack of control group presented another limitation with regard to identifying who benefits the most from treatment. Without a control group, this study used correlational analyses to predict improvement following the treatment. With the inclusion of a control group one can use a moderation analysis to examine interactions between the groups. This type of analysis can help elucidate more fully how the predictor relates to outcome by showing how a predictor like ambivalence over emotional expression predicts different outcomes in a treatment vs. a control group. For example, greater ambivalence may predict better outcomes in the treatment group but predict poorer outcomes in the control group. The

current design, however, cannot distinguish whether a measure predicts responses to this treatment, or just changes in outcomes in general.

Also discussed previously, the small sample size was a limitation for the last two hypotheses in this study. Regarding the second hypothesis which examined the predictive ability of the baseline measures, a reduced sample size at the 3-month follow-up may have contributed to the lack of predictive ability at that time point. With a larger sample at 3 months, it is possible that some of the significant predictors of change in outcome at post-treatment would be maintained at 3 months. Furthermore, as discussed above, the small sample size may have limited the ability to find differences between the group who completed the emotion assessment exercise and the group who did not. The reason for the small sample size presents another limitation. Recruitment began in the fall of 2008 and continued through spring of 2010.Unfortunately, referrals for the treatment program reduced significantly and, thus, recruitment was slower than expected and after this spring was stopped with a smaller sample than expected. Because Dr. Schubiner is the only current provider for this treatment, it was not possible to collect participants from other clinics. Another factor that contributed to the smaller sample size was missing data. Some of the measures were missing on several participants or were not able to be scored because of incomplete responding. Therefore, some of the analyses included less participants than were actually included in the study.

Selection bias is another important consideration for this treatment and could potentially limit the results. It is a select group of patients who are referred for this treatment program in the first place, usually those whose providers are most frustrated

with treating them. However, this factor could also provide further support for the effectiveness of this study if the treatment is this beneficial for the most complicated patients. Another important aspect of selection bias is particularly relevant for this treatment. Starting with the initial evaluation, Dr. Schubiner informs the patient about mind body syndrome and how it is necessary to refute medical explanations for pain and to accept emotional explanations. Some patients may be resistant to this theory, and therefore, not complete the treatment. Moreover, it is a subset of those patients who will agree to participate in a research study. In this study, 37% of the patients referred for the study did not participate. Some of these patients did not participate because of logistical reasons including becoming illegible after not participating in the treatment and not being able to schedule them for the assessment before the treatment started. However, approximately half of this percentage expressed a lack of interest, and these patients are likely different in important ways from those patients who are interested in research. It is possible that they may not have been as invested in the treatment and may not have benefitted as much.

A final limitation regarding the progression of the treatment program is that the treatment actually begins with the initial evaluation with Dr. Schubiner when he explains his model for chronic pain and encourages patients to read about mind body syndrome. In an attempt to account for this process, key outcome measures were mailed to the patients prior to their evaluation; however, most of the baseline measures were completed after the patients met with Dr. Schubiner.

Additionally, although this sample included an adequate number of male patients, it was a primarily Caucasian sample which limits generalizability of the findings. Also,

another limitation could be the reliance on self-report measures in this study. Self-report measures are useful but the study could have been strengthened with the inclusion of an objective measure of pain tolerance or the observations of another person.

Future Research

Other than the ideas discussed previously, including the utilization of a randomized controlled design, a larger, more diverse sample, and the incorporation of objective measures of improvement, future studies should continue to explore potential moderators of predictors of treatment outcome. This study found support for using depression and ambivalence over emotional expression as predictors of change in outcome, but many of the other predictors had scattered and sometimes inconsistent results. Re-examining these predictors in a larger, more diverse sample will help determine their utility as predictors. Also, this study did not assess beliefs about pain or specific measures of pain coping as typically measured in cognitive-behavioral treatment studies. It would be interesting to compare the predictive ability of these measures with the emotion regulation measures used in this study. It would also be valuable to directly compare this intervention with a cognitive-behavioral intervention to see if this treatment does cause greater improvement in symptoms than CBT.

Additionally, this study attempted to determine *who* benefits from this treatment but future studies should address *how* this treatment might work. This treatment consists of six components: reading about mind body syndrome, repudiating physical explanations for symptoms, writing exercises, reflecting with meditative exercises, reprogramming the mind, and rebuilding the life. Over four weeks, patients are instructed to complete daily exercises of writing, meditation, and behavioral activation.

This study demonstrated that patients reported improved outcome after completing these exercises. However, it is unknown how these components lead to change. One possibility is that patients are processing avoided emotions and unresolved stressors, and that changes in these domains are responsible for improvements in pain, disability, and emotional functioning. Yet another possibility is that patients are increasing their self-efficacy to make changes and cope with their pain or that they are changing the way that they think about their pain. Future studies should evaluate these variables over the course of treatment to see how they relate to changes in outcome. Similarly, dismantling studies would be beneficial to evaluate which of these components are most influential on outcome. It is likely that each of these components is not equally effective. Moreover, some patients may be responsive to different components.

Further exploration of using the novel emotion assessment as preparation for treatment is also warranted. It will be important to address the limitations described above including a sample size with sufficient power to detect group differences. This exercise could also be a useful predictor of treatment outcome and would provide an objective assessment of emotional expressive ability. Given the conflicting results found with the self-report emotion regulation predictors in this sample, it would be interesting to see how an objective measure of ability related to change in outcomes. Another goal for future research will be to evaluate this treatment program when facilitated by providers other than Dr. Schubiner. It is possible that, because he created the program and strongly advocates it, part of the beneficial outcomes is due to his charisma and belief. He has also published a comprehensive, self-explanatory treatment workbook that patients can complete on their own. Future studies could evaluate the effectiveness

of completing this treatment without the guidance and interaction with a facilitator. Alternatively, research has shown than when participants benefit more from written emotional disclosure when they know their writings will be read by someone (Radcliffe et al., 2007). Thus, including a sharing component in the group where people disclose their stressful experiences and related emotions could prove beneficial.

In conclusion, this study suggests that Schubiner's treatment is very effective for patients with chronic pain. In fact, this brief, group treatment led to substantial improvements in pain and pain-related disability as well as improvements in emotional functioning. Furthermore, this study contributed to the growing movement that seeks to identify differential response to treatment for chronic pain. Patients with significant depression who were aware of their emotions but uncertain about expressing them benefitted most from this treatment. These results provide further support for the theory that stressful experiences, poor emotion regulation skills, and emotional disorders relate to chronic pain and that, more importantly, addressing these elements in an emotion-focused treatment program results in improvements in unresolved stress, emotional functioning, and in chronic pain.

APPENDIX A (Informed Consent)

St. John Health/Providence Hospital and Medical Centers
CONSENT TO PARTICIPATE IN A RESEARCH STUDY
AND
AUTHORIZATION TO USE OR DISCLOSE PROTECTED HEALTH INFORMATION FOR RESEARCH

TO BE CONDUCTED
AT
PROVIDENCE HOSPITAL AND MEDICAL CENTERS

Title: Evaluating a Chronic Pain Treatment Program

Principal Investigators: **Howard Schubiner, M.D.**, Providence Hospital
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Sub-Investigators and/or Study Staff: Amanda Burger, M.A., Wayne State University
Maren Hyde, Wayne State University
Alaa Hijazi, Wayne State University

Background and Purpose

This form contains information about a research study. You understand that you are being asked to participate in a research study sponsored by Providence Hospital and Wayne State University. If you choose to participate in this research study, you should clearly understand all information contained in this consent before you agree to participate by signing your name to the last page. After you sign the form, you will be given a copy, and an additional copy will remain in your medical chart.

You understand that this is a research study. You have been asked to participate because you are a patient with a chronic pain problem and you plan to participate in a treatment program offered by Dr. Howard Schubiner at Providence Hospital and Medical Center. All subjects participating in research must volunteer, and be informed about the purpose, risks, benefits if any, and alternatives. If you have any questions about this research or the document, please ask.

The purpose of this study is to a) evaluate how well Dr. Schubiner's treatment program works for people with chronic pain problems, determine which patients are most likely to benefit, and test the effects of a communication exercise.

Study Description, Location, and Duration

If you choose to take part in this study you will be asked to come to the hospital two times to complete some questionnaires and be interviewed about your pain, functioning, stress, and relationships. These two visits will occur before and soon after you participate in Dr. Schubiner's treatment program. The first session at the hospital will take approximately 2 hours. In addition to completing various questionnaires, half of the patients will be asked to participate in a communications exercise and discussion, which will take about 15 minutes. If you are randomly assigned to this exercise (like by the flip of a coin), then you will be asked to demonstrate how you might communicate different feelings to someone, such as being assertive, or telling someone that you care. At the end of this exercise, you will be asked to answer several interview questions about your communication style, emotions, and pain. This communications exercise will be audiotaped. There is a 50-50 chance that you will be asked to do this communications exercise.

After the first session, you will then participate in the treatment program just as you would have if you were not participating in this study. Within a few weeks of completing the treatment program, you will return to the hospital to complete questionnaires about your health, pain, and mood, and you will be interviewed about your reactions to the treatment program. This session will take approximately 1 hour.

Finally, in order to evaluate the outcomes of the treatment over time, we will mail you follow-up questionnaires 3 months and 6 months after the program ends, and ask you to report again on your pain, health, and stress by returning the questionnaires in a stamped envelope that we provide. These questionnaires should take about 20 minutes each.

Approximately 100 people will be in this study. Your total participation will be about 4 hours over a time span of seven to eight months. Your part in the study will be completed once you have returned the final packet of questionnaires six months after you have completed the treatment program.

Possible Risks and Discomforts

We expect the risks of your participating in this study to be minimal and unlikely. However, you may experience a negative mood when questionnaires and/or interviews ask to you think about experiences that may have been difficult for you. You may consult Dr. Schubiner or ask the research team for a referral if you experience such discomfort. There may be other risks that are unknown at this time.

Benefits

There may be no direct benefit to you in participating in the study. It is possible that you may learn new things about yourself and experience improvements in your health, pain, and mood. In the future, other patients may benefit from the results of this study, when they become known.

Alternative Treatments

An alternative is to not participate. You do not have to participate in this research study in order to receive Dr. Schubiner's treatment program for your chronic pain.

Voluntary Participation

You understand that your participation in this study is voluntary and that your refusal to participate will cause no penalty or loss of benefits that you would otherwise receive. If you decide to participate, you may change your mind about being in the study, and may quit at any time without penalty or loss of benefits regarding your future care. If new information becomes available during the study that may affect your willingness to continue in the study, your doctor and/or his/her associate will discuss this information with you. Also, your doctor may stop your participation at any time if he/she feels that is in your best interest.

Compensation

You will receive a total of $100 for completing all four assessments. You will receive $50 for completing the first 2-hour assessment at the hospital, $30 for completing the 1-hour assessment at the hospital, and $10 each for completing each of the mailed questionnaire packets three and six months later. Because the treatment program is not part of the research study you will not receive any compensation for completing treatment, and you or your insurer will need to pay for the treatment.

No funds have been set aside for injured research subjects. While medical care is available should an injury occur, the cost will be billed to you or your insurer in the ordinary manner.

Confidentiality Of Records

The principal investigators will have access to your medical records and your test results. While absolute confidentiality cannot be guaranteed, you understand that all medical records and research material that could identify you will be kept as confidential as possible within state and federal laws. However, you risk the loss of confidentiality if you are thought to be at risk for self-harm or harming another, if there is a concern that child abuse or elder abuse has possibly occurred, or if it is discovered that you have a reportable communicable disease (certain sexually transmitted diseases and/or HIV), then this information must be released to the appropriate authorities or public health department. If you disclose illegal criminal activities, illegal substance abuse, or violence, this information may be released to the appropriate authorities. You also understand that your medical records could be examined by the sponsor, the Institutional Review Board (a group of medical and lay people at this hospital charged with protecting human subjects' rights) or government agencies in order to verify the data collected during this research study. If the results of this study are presented in any public forum, you will not be identified by name.

Questions Regarding this Study

If you have any questions about your rights as a subject in this clinical research study, you may contact the IRB (Institutional Review Board) office at 248 849-8889 at Providence Hospital and Medical Center.

If you have any questions regarding a research-related injury, you can contact: Dr. Howard Schubiner at (248) 849-4728.

Authorization to Use and Disclose Protected Health Information (PHI)

Your participation in this study will require the use and disclosure of certain medical and other information about you. You will not be able to participate if you do not agree to the use and disclosure of your information.

The protected health information (PHI) that may be used or disclosed includes:

- All information collected during the research study as described in this form,
- The information that is contained in any medical record that is created during your participation in this research, and
- Other information in your medical record that may be considered related to your participation in this research, which may include: your medical history, physical examination results, laboratory test results or other test results (like an x-ray, scan, biopsy, EKG).

Who may see, use or disclose your PHI:

☑ The researchers and members of the research team

☑ Other health care providers or employees of St. John Health who provide services to you for this study

☑ Representatives of the Institutional Review Board, the FDA (Food and Drug Administration), or other governmental agencies involved in research monitoring

☑ Members of the safety monitoring board

☑ Other agencies as required by law

❑ The sponsor, _____

❑ A clinical research organization, or other agent of the sponsor

❑ A laboratory outside of St. John Health System

What This Authorization Means

You understand that we cannot guarantee that your protected health information shared or disclosed under this Authorization could not be additionally shared or disclosed by the individual or organization that receives the information, and the privacy of your PHI may no longer be protected by the law.

You have the right to not agree to disclose your PHI. However, if you do not agree by signing this Authorization, you will not be able to participate in this research study.

If you do sign below, you have the right to withdraw your permission at any time, but you must do so in writing. You may send the written withdrawal to:

Dr. Howard Schubiner

Dept. of Internal Medicine
Providence Hospital and Medical Centers
16001 W. Nine Mile Rd.
Southfield, MI 48075

You may no longer be allowed to participate in the research if you withdraw your permission. Also, you understand that any information collected before written notice of withdrawal is received will be shared as you have agreed.

You have the right to review your PHI. However, if you agree to participate in the research study and sign below, you will not be able to look at your research information until the research study is completed.

You will receive a copy of this document, the Consent to Participate in a Clinical Research Study and Authorization to Use or Disclose Protected Health Information for Research.

Expiration Date

Your authorization (permission) to use and disclose your health information will continue indefinitely, subject to the procedures and limits described in this form. Your health information will only be used for the purposes defined within this consent and authorization form.

Other Considerations

You have fully discussed and understand the purpose of this clinical research study and how it will be carried out. You have been allowed to ask questions about the study and all of your questions have been answered. You have read this consent form or had the complete form read to you and understand it. You know that your participation in this study is fully voluntary and you may withdraw at any time. If you refuse to participate or later withdraw from the study, it will not affect your care in any way. You also understand that by consenting to participate in this study, you are not waiving any other legal rights you may have because you are a subject in this study or as a patient at Providence Hospital & Medical Center or at Wayne State University / Detroit Medical Center.

Questions Regarding the Study

If you have any questions about your rights as a subject in this clinical research study, you may contact the IRB (Institutional Review Board) office at (248) 849-8889 at Providence Hospital and Medical Center. You may contact David Svinarich, Ph.D. of the Providence Hospital Research Department at (248) 849-3326 for any questions about your rights as a research participant. You may also contact the Chair of the Wayne State University Human Investigation Committee at (313) 577-1628.

You have the right to ask questions concerning this study at any time, and you are urged to do so. If you have questions concerning the study or have a research related injury, you should contact Dr. Howard Schubiner at (248) 849-4728 or Dr. Mark Lumley at (313) 577-2773.

Signatures

Research Subject

I voluntarily agree to participate in this research study. I understand the information printed on this form. I have discussed this study, its risks and potential benefits, and my other choices with _____. My questions so far have been answered. I understand that if I have more questions or concerns about the study or my participation as a research subject, I may contact one of the people listed above. I understand that I will receive a copy of this form at the time I sign it and later upon request. I understand that if my ability to consent for myself changes, either I or my legal representative may be asked to re-consent prior to my continued participation in this study.

Signature of Subject: _____ *Date:* _____

Name (Print legal name): _____

Witness

I observed the above subject sign this consent document.

Signature of Witness: _____ *Date:* _____

Name: _____

Principal Investigator

I have given this research subject (or his/her legally authorized representative, if applicable) information about this study that I believe is accurate and complete. The subject has indicated that he or she understands the nature of the study and the risks and benefits of participating.

Signature of Investigator: _____ *Date:* _____

Name: _____ *Title:* _____

APPENDIX B (MEASURES)

BRIEF PAIN INVENTORY

1. Please rate your pain by circling the one number that best describes your pain at its *worst* in the last week.

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

2. Please rate your pain by circling the one number that best describes your pain at its *least* in the last week.

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

3. Please rate your pain by circling 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

4. Please rate your pain by circling the one number that tell 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

For the next set of questions, choose the one number that describes how, during the past week, pain has interfered with the following activities. Please use the 0 to 10 scale where a 0 means that "pain does not interfere with that activity" and a 10 means that "pain completely interferes."

Does not interfere										**Completely interferes**
0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

a) General Activity……..….0 1 2 3 4 5 6 7 8 9 10

b) Mood……...0 1 2 3 4 5 6 7 8 9 10

c) Mobility (ability to get around)…….0 1 2 3 4 5 6 7 8 9 10

d) Normal Work (includes both work outside the home and housework) ……..0 1 2 3 4 5 6 7 8 9 10

e) Relations With Other People……..……0 1 2 3 4 5 6 7 8 9 10

f) Sleep……..……0 1 2 3 4 5 6 7 8 9 10

g) Enjoyment Of Life……..……0 1 2 3 4 5 6 7 8 9 10

h) Self Care (taking care of your daily needs)……...0 1 2 3 4 5 6 7 8 9 10

i) Recreational Activities……...0 1 2 3 4 5 6 7 8 9 10

j) Social Activities……..….0 1 2 3 4 5 6 7 8 9 10

k) Communication With Others……..……0 1 2 3 4 5 6 7 8 9 10

l) Learning New Information or Skills……..0 1 2 3 4 5 6 7 8 9 10

CENTER FOR EPIDEMIOLOGIC STUDIES—DEPRESSION SCALE				
Circle the number of each statement which best describes how often you felt or behaved this way – DURING THE PAST WEEK.				
	Rarely or none of the time (less than 1 day)	**Some or a little of the time (1-2 days)**	**Occasionally or a moderate amount of the time (3-4 days)**	**Most or all of the time (5-7 days)**
During the past week:	0	1	2	3
1) I was bothered by things that usually don't bother me	0	1	2	3
2) I did not feel like eating; my appetite was poor	0	1	2	3
3) I felt that I could not shake off the blues even with help from my family and friends	0	1	2	3
4) I felt that I was just as good as other people	0	1	2	3
5) I had trouble keeping my mind on what I was doing	0	1	2	3
6) I felt depressed	0	1	2	3
7) I felt that everything I did was an effort	0	1	2	3
8) I felt hopeful about the future	0	1	2	3
9) I thought my life had been a failure	0	1	2	3
10) I felt fearful	0	1	2	3
11) My sleep was restless	0	1	2	3
12) I was happy	0	1	2	3
13) I talked less than usual	0	1	2	3
14) I felt lonely	0	1	2	3
15) People were unfriendly	0	1	2	3
16) I enjoyed life	0	1	2	3
17) I had crying spells	0	1	2	3
18) I felt sad	0	1	2	3
19) I felt that people disliked me	0	1	2	3

20) I could not get “going”	0	1	2	3

Satisfaction with Life Scale

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

____ In most ways my life is close to my ideal.

____ The conditions of my life are excellent.

____ I am satisfied with my life.

____ So far I have gotten the important things I want in life.

____ If I could live my life over, I would change almost nothing.

Chronic Pain Acceptance Questionnaire

Directions: below you will find a list of statements. Please rate the truth of each statement as it applies to you. Use the following rating scale to make your choices. For instance, if you believe a statement is `Always True,' you would write a 6 in the blank next to that statement

0 Never true 1 Very rarely true 2 Seldom true 3 Sometimes true 4 Often true 5 Almost always true

1. I am getting on with the business of living no matter what my level of pain is .....
2. My life is going well, even though I have chronic pain .....
3. It's OK to experience pain .....
4. I would gladly sacrifice important things in my life to control this pain better .....
5. It's not necessary for me to control my pain in order to handle my life well .....
6. Although things have changed, I am living a normal life despite my chronic pain .....
7. I need to concentrate on getting rid of my pain .....
8. There are many activities I do when I feel pain .....
9. I lead a full life even though I have chronic pain .....
10. Controlling pain is less important than any other goals in my life .....
11. My thoughts and feelings about pain must change before I can take important steps in my life .....
12. Despite the pain, I am now sticking to a certain course in my life .....
13. Keeping my pain level under control takes first priority whenever I'm doing something .....
14. Before I can make any serious plans, I have to get some control over my pain .....
15. When my pain increases, I can still take care of my responsibilities .....
16. I will have better control over my life if I can control my negative thoughts about pain .....
17. I avoid putting myself in situations where my pain might increase .....
18. My worries and fears about what pain will do to me are true .....
19. It's a relief to realize that I don't have to change my pain to get on with my life .....
20. I have to struggle to do things when I have pain .....

IMPACT OF EVENT SCALE-REVISED

Instructions: The following is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you *during the past 7 days* with respect to _____, how much were you distressed or bothered by these difficulties?

		Not at all	A little bit	Mode rate-ly	Quite a bit	Ex-treme-ly
1	Any reminder brought back feelings about it.	0	1	2	3	4
2	I had trouble staying asleep.	0	1	2	3	4
3	Other things kept making me think about it.	0	1	2	3	4
4	I felt irritable and angry.	0	1	2	3	4
5	I avoided letting myself get upset when I thought about it or was reminded of it.	0	1	2	3	4
6	I thought about it when I didn't mean to.	0	1	2	3	4
7	I felt as if it hadn't happened or wasn't real.	0	1	2	3	4
8	I stayed away from reminders about it.	0	1	2	3	4
9	Pictures about it popped into my mind.	0	1	2	3	4
10	I was jumpy and easily startled.	0	1	2	3	4
11	I tried not to think about it.	0	1	2	3	4
12	I was aware that I still had a lot of feelings about it, but I didn't deal with them.	0	1	2	3	4
13	My feelings about it were kind of numb.	0	1	2	3	4
14	I found myself acting or feeling like I was back at that time.	0	1	2	3	4
15	I had trouble falling asleep.	0	1	2	3	4
16	I had waves of strong feelings about it.	0	1	2	3	4
17	I tried to remove it from my memory.	0	1	2	3	4
18	I had trouble concentrating.	0	1	2	3	4
19	Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart.	0	1	2	3	4
20	I had dreams about it.	0	1	2	3	4
21	I felt watchful and on guard.	0	1	2	3	4
22	I tried not to talk about it.	0	1	2	3	4

TAS-20

Please indicate how much you agree or disagree with each of the following statements by writing a number from 1 to 5 in the blank in front of the statement. Use this scale:

1 = Strongly disagree
2 = Disagree
3 = Neither disagree nor agree
4 = Agree
5 = Strongly agree

1. _____ I am often confused about what emotion I am feeling.
2. _____ It is difficult for me to find the right words for my feelings.
3. _____ I have physical sensations that even doctors don't understand.
4. _____ I am able to describe my feelings easily.
5. _____ I prefer to analyze problems rather than just describe them.
6. _____ When I am upset, I don't know if I am sad, frightened or angry.
7. _____ I am often puzzled by sensations in my body.
8. _____ I prefer to just let things happen rather than to understand why they turned out that way.
9. _____ I have feelings that I cant quite identify.
10. _____ Being in touch with emotions is essential.
11. _____ I find it hard to describe how I feel.
12. _____ People tell me to describe my feelings more.
13. _____ I don't know what's going on inside me.
14. _____ I often don't know why I am angry.
15. _____ I prefer talking to people about their daily activities rather than their feelings.
16. _____ I prefer to watch "light" entertainment shows rather than psychological dramas.
17. _____ It is difficult for me to reveal my innermost feelings, even to close friends.
18. _____ I can feel close to someone, even in moments of silence.
19. _____ I find examination of my feelings useful in solving personal problems.
20. _____ Looking for hidden meaning in movies or plays distracts from their enjoyment.

Code ___

AEQ

Below are some statements that refer to how people sometimes feel and act. Using the following scale, rate each statement to indicate how frequently you have felt or experience each one.

1	2	3	4	5
I have never felt like this				I feel like this a lot

The statements may consist of 2 thoughts. Carefully read the statement as a whole before deciding on how characteristic it is of you. For example, consider item:

" I try to honestly criticize others for their own good, but I worry they may get angry with me if I do so"

You would give this time a high rating *if and only If* both parts of the statement apply to you; that is, you try to honestly criticize others *and* you worry about their getting angry. If only one part of the statement applies to you, you would give this item a lower rating. It is important to consider the complete thoughts being expressed before you respond.

___1. I make an effort to control my temper at all times even though I'd like to act on these feelings at times.

___ 2. Often I'd like to show others how I feel, but something seems to hold me back.

___3. I try to refrain from getting angry at my family even though I want to at times.

___ 4. I try to show people that I love them, although at times I am afraid that it may make me appear weak or too sensitive.

___ 5. Often I find that I am not able to tell others how much they really mean to me.

___ 6. I want to tell someone when I love them, but it is difficult to find the right words.

___ 7. I would like to express my disappointment when things don't go as well as planned, but I don't want to appear vulnerable.

___ 8. I would like to be more spontaneous in my emotional reactions, but I just can't seem to do it

___ 9. I try to suppress my anger, but I would like other people to know how I feel.

___ 10. It is hard to find the right words to indicate to others what I am really feelings.

___ 11. I worry that if I express negative emotions such as fear and anger, other people will not approve of me.

___ 12. I feel guilty after I have expressed my anger to someone.

___ 13. I often cannot bring myself to express what I am really feeling.

___ 14. After I express anger at someone, it bothers me for a long time.

Communicating Thoughts and Feelings Questionnaire

(Mark A. Lumley & Amanda Burger, Wayne State University)

In this questionnaire, you will be presented with a series of situations that could happen between you and another person, and a response that you might make to that person. You should read the situation and the response, and then think about how likely you are to make that response.

For each scenario, you should think about making the response to each of four different people—your father (or the primary male authority during your first 18 years), your mother, your significant other, and a stranger (someone with whom you have no relationship).

A significant other is the *person with whom you feel closest, typically a spouse or partner.* If you do not have a spouse or partner, then you should select anyone that you relate to on a regular basis. Please indicate who your significant other is (check one):

__Spouse __Partner/Companion __ Friend __ Neighbor

___Housemate/Roommate ___Child or other relative __Other (describe):_____

For each of the four relationships, enter a number from 0 to 4 regarding how likely you are to make that response to that person.

0 = Definitely can not do it
1 = Probably can not do it
2 = Can probably do it, but with some difficulty
3 = Can do it with only a little difficulty
4 = Can do it easily

1. You have done something wrong to the person. Can you tell that person that you are sorry for doing it to them?

____ Father
____ Mother
____ Significant other
____ Stranger

2. You are asked to do something for the person, but you do not want to. Can you tell that person that you do not want to do it?

____ Father
____ Mother
____ Significant other
____ Stranger

3. The person has helped you. Can you tell that person that you are thankful for what they have done?

____ Father
____ Mother
____ Significant other
____ Stranger

4. The person has done something to you that makes you mad. Can you tell that person that you are mad because of what they did?

____ Father
____ Mother
____ Significant other
____ Stranger

5. The person has achieved something or has positive qualities. Can you compliment or praise that person?

____ Father
____ Mother
____ Significant other
____ Stranger

6. You want the person to do something for you. Can you directly tell that person to do it?

____ Father
____ Mother
____ Significant other
____ Stranger

7. Somebody has hurt you in the past and seeks your forgiveness. Can you tell them that you forgive them?

____ Father
____ Mother
____ Significant other
____ Stranger

8. You disagree with the person's opinion about a topic that is important to you, and believe that they are wrong. Can you tell that person that you disagree with them and that they are wrong?

____ Father
____ Mother

____ Significant other
____ Stranger

9. You feel love toward the person. Can you tell that person “I love you.”?

____ Father
____ Mother
____ Significant other
____ Stranger

11. You want to make a connection with the person. Can you give that person an embrace or hug?

____ Father
____ Mother
____ Significant other
____ Stranger

13. You have done something that you feel guilty or ashamed about. Can you tell or share with the person what you have done?

____ Father
____ Mother
____ Significant other
____ Stranger

Date _____

Treatment Attitudes Survey: Pre-Treatment

1. What do you think causes your pain? (Ex. stress, diet, genetics, injury, etc.). Please describe as fully as possible.

_____

_____

2. How much do you think that biological, medical, or genetic factors cause your pain?

0	1	2	3	4
Not at all	A little bit	Moderately	Quite a lot	Completely

3. How much do you think that psychological factors such as stress or emotions cause your pain?

0	1	2	3	4
Not at all	A little bit	Moderately	Quite a lot	Completely

4. How much do you think that stressful life events or emotional trauma caused your pain problem?

0	1	2	3	4
Not at all	A little bit	Moderately	Quite a lot	Completely

5. How much to you think that stressful life events or emotional trauma make your pain worse?

0	1	2	3	4
Not at all	A little bit	Moderately	Quite a lot	Completely

6. How much do you think that the source or cause of your pain is in your mind?

0	1	2	3	4
Not at all	A little bit	Moderately	Quite a lot	Completely

7. How much do you think that your mind can eliminate the pain?

0	1	2	3	4
Not at all	A little bit	Moderately	Quite a lot	Completely

8. How much do you agree with the suggestion that a medical disease is NOT the source of your pain?

0	1	2	3	4
Not at all	A little bit	Moderately	Quite a lot	Completely

9. How much of Dr. Sarno's book, The Mindbody Prescription, did you read?

0	1	2	3	4
Not at all	A little bit	Moderately	Quite a lot	Completely

10. How much did your pain improve after reading the book?

0	1	2	3	4
Not at all	A little bit	Moderately	Quite a lot	Completel

APPENDIX C (Emotional Assessment)

Communicating Feelings Therapeutic Assessment Exercise

(Assessor Script and Rating Scale)

(Mark A. Lumley & Amanda Burger, Wayne State University)

"People have important thoughts and feelings about things that happen in relationships. Some thoughts and feelings can be expressed easily comfortably, but other feelings are hard to express or communicate.

In this exercise, I am going to ask you to demonstrate how you might communicate 7 different feelings. For each one, I'll describe a situation, and ask you to demonstrate how you might communicate it, using both words as well as nonverbal expressions, such as with your tone of voice, your eyes, your hands, and your posture. I'll give you more explanations as we go along.

(For each task, read the italicized text. Each section has a default phrase for participants who struggle with the task. Rate the patient's performance on each task using the 0-4 rating scale below.)

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

1. Declining a request

   Imagine that you have been asked to do something for someone, but you do not want to it. How would you express that you do not want to do it?

a) Generic demonstration (without any specific target or example)

First, I would like you to demonstrate how you might decline a request in general; that is, without thinking of any specific person or example in your life. I want to see what it is like for you to communicate with your words and actions, so I would like you to demonstrate how you might decline a request in the most direct, genuine, and straightforward way possible, using your tone of voice, emotions, mannerisms, and actions.

(If participant struggles have them use the phrase: "*No I do not want to do that*.")

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty

___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

b) Specific target and example

Now I would like to repeat this exercise, but this time, have you demonstrate it with respect to someone in your life who you need to decline a request from. Ideally, it should be someone in your life right now, about a situation with that person that you would like to decline, but it could be a person and situation from your past. Take a few moments and think about that person and the situation, and what you are going to say to them. (Pause). Now imagine that the person is sitting in that chair. You should tell them directly and honestly your feelings and wishes. You should use their first name and be specific about what the request is that you are declining. You should use any words, tone, actions, or mannerisms to help get your message across genuinely and directly.

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ not able to think of an example

2. Expressing gratitude

> *Imagine that somebody has done something helpful to you. How would you express your thankfulness or gratitude to that person for what they have done?*

a) Do it generically (without any specific target or example)

First, I would like you to demonstrate how you might express to someone that you are thankful for something they have done, but without thinking of any specific person or example in your life. I want to see what it is like for you to communicate with your words and actions. Please do so in a direct, genuine, and straightforward way using your tone of voice, emotions, mannerisms, and actions.

(If participant struggles have them use the phrase: "*Thank you for helping me*.")

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

b) Do it specifically to a difficult target and with specific example

Now take a few minutes to think about someone in your life who you need to express that you are thankful to them because of something they have done for you. Ideally, it should be someone in the present to whom it is difficult to express thanks to. Take a couple of minutes and think about that person and situation, and how you are going to express it to them. Now imagine that the person is sitting in that chair. You should tell them directly, honestly your feelings and wishes. You should use their first name and be specific about what you are thankful for. You should use any actions or mannerisms that help get your message across genuinely and directly.

(If the participant cannot think of their own example have them identify a person with whom it would be difficult to communicate anger and use the phrase "*Thank you for helping me.*" and still imagine they are speaking to that person.)

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

3. Making a demand

> *Imagine that you need help and believe that somebody should help you. How would you express to that person that you expect them to help you?*

a) Do it generically (without any specific target or example)

First, I would like you to demonstrate making a demand of someone without thinking of any specific person or example in your life. I want to see what it is like for you to express this with your words and actions. Please do so in a direct, genuine, and straightforward way using your tone of voice, emotions, mannerisms, and actions.

(If participant struggles have them use the phrase: "*I need you to help me*.")

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

b) Do it specifically to a difficult target and with specific example

Now take a few minutes to think about someone in your life who you think you should help you do something. Ideally, it should be someone in the present who it is difficult to make a demand to. Take a couple of minutes and think about that person and situation, and what you are going to say to them. Now imagine that the person is sitting in that chair. You should tell them directly, honestly your feelings and wishes. You should use their first name and be specific about what help you need. You should use any actions or mannerisms that help get your message across genuinely and directly.

(If the participant cannot think of their own example have them identify a person with whom it would be difficult to make a demand and use the phrase "*I need you to help me*." and still imagine they are speaking to that person.)

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

4. Expressing love

> *Imagine that you are close to a person and love them. How would you express to that person that you love them?*

a) Do it generically (without any specific target or example)

First, I would like you to demonstrate telling somebody that you love them without thinking of any specific person or example in your life. I want to see what it is like for you to communicate this with your words and actions. Please do so in a direct, genuine, and straightforward way using your tone of voice, emotions, mannerisms, and actions.

(If participant struggles have them use the phrase: "*I love you*.")

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

b) Do it specifically to a difficult target and with specific example

Now take a few minutes to think about someone in your life who you need to express to them that you love them. Ideally, it should be someone in the present who it is difficult to express love to. Take a couple of minutes and think about that person and situation, and what you are going to say to them. Now imagine that the person is sitting in that chair. You should tell them directly, honestly your feelings and wishes. You should use their first name and be specific about what help you need. You should use any actions or mannerisms that help get your message across genuinely and directly.

(If the participant cannot think of their own example have them identify a person with whom it would be difficult to communicate love and use the phrase "*I love you.*" and still imagine they are speaking to that person.)

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

5. Disagreeing and stating that a person is wrong about an important topic

Imagine that you disagree with someone and believe that they are wrong about some topic. How would you tell that person that you think they are wrong?

a) Do it generically (without any specific target or example)

First, I would like you to demonstrate expressing to somebody that you disagree with them and that they are wrong about an important topic, but do this without thinking of any specific person or example in your life. I want to see what it is like for you to communicate that with your words and actions. Please do so in a direct, genuine, and straightforward way using your tone of voice, emotions, mannerisms, and actions.

(If participant struggles have them use the phrase: "*I think that you are wrong and I disagree with you*.")

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

b) Do it specifically to a difficult target and with specific example

Now take a few minutes to think about someone in your life who you need to express that you disagree with them, and that they are wrong. Ideally, it should be someone in the present who it is difficult to disagree with. Take a couple of minutes and think about that person and situation, and what you are going to say to them. Now imagine that the person is sitting in that chair. You should tell them directly, honestly your feelings and wishes. You should use their name and be specific about what you disagree about and how wrong they are. You should use any actions or mannerisms that help get your message across genuinely and directly.

(If the participant cannot think of their own example have them identify a person with whom it would be difficult to communicate anger and use the phrase "I think that you are wrong and I disagree with you" and still imagine they are speaking to that person.)

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

6. Apologizing

> *Imagine that you have done something wrong to another person. How would you express to that person that you are sorry for doing it to them?*

a) Do it generically (without any specific target or example)

First, I would like you to demonstrate expressing to somebody that you are sorry for something you have done, without thinking of any specific person or example in your life. I want to see what it is like for you to communicate with your words and actions the following idea. Please do so in a direct, genuine, and straightforward way using your tone of voice, emotions, mannerisms, and actions.

(If participant struggles have them use the phrase: "*I am sorry that I hurt your feelings*.")

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

b) Do it specifically to a difficult target and with specific example

Now take a few minutes to think about someone in your life to whom you need to express that you are sorry for something you have done. Ideally, it should be someone in the present who it is difficult to apologize to. Take a couple of minutes and think about that person and situation, and what you are going to say to them. Now imagine that the person is sitting in that chair. You should tell them directly, honestly your feelings and wishes. You should use their first name and be specific about what you are sorry for. You should use any actions or mannerisms that help get your message across genuinely and directly.

(If the participant cannot think of their own example have them identify a person with whom it would be difficult to apologize to and use the phrase "*I am sorry that I hurt your feelings.*" and still imagine they are speaking to that person.)

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

7. Communicating anger

> *Imagine that somebody has made you mad. How would you tell that person that you are angry with them?*

a) Do it generically (without any specific target or example)

First, I would like you to demonstrate how you would express that you are mad because of something they have done, without thinking of any specific person or example in your life. I want to see what it is like for you to communicate with your words and actions the following idea. Please do so in a direct, genuine, and straightforward way using your tone of voice, emotions, mannerisms, and actions.

(If participant struggles have them use the phrase: "*I am angry with you*.")

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

b) Do it specifically to a difficult target and with specific example

Now take a few minutes to think about someone in your life to whom you need to express that you are angry with them because of something they have done. Ideally, it should be someone in the present who it is difficult to show anger to. Take a couple of minutes and think about that person and situation, and what you are going to say to them. Now imagine that the person is sitting in that chair. You should tell them directly, honestly your feelings and wishes. You should use their first name and be specific about what made you mad. You should use any actions or mannerisms that help get your message across genuinely and directly.

(If the participant cannot think of their own example have them identify a person with whom it would be difficult to communicate anger and use the phrase "*I am angry with you.*" and still imagine they are speaking to that person.)

___ 0 = Did not do it at all
___ 1 = Did it with great difficulty
___ 2 = Did it with some difficulty
___ 3 = Did it with a little difficulty
___ 4 = Did it easily

___ used the default phrase

APPENDIX D (Exploration Questions)

Exploration Questions

1. Were there any parts of these tasks that were particularly difficult for you?
2. Were there any parts of these tasks that were particularly easy for you?
3. How typical were these responses to your everyday communication with people in your life?
4. How does the way you handle your emotions and needs affect your pain and your relationships?
5. Is there anything you would like to change about how you express your emotions and needs?
6. What kind of treatment goals can you make based on what you have learned today?

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ABSTRACT

EVALUATING OUTCOMES AND RESPONSE PROFILES OF A PSYCHOLOGICAL TREATMENT FOR PEOPLE WITH CHRONIC PAIN

by

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Major: Psychology (Clinical)

Degree: Doctor of Philosophy

Chronic pain is a leading cause of suffering, disability, and high health care costs. Traditional treatment approaches such as medical or cognitive-behavioral interventions have produced variable and often limited results. Research has suggested that increased rates of stressful life events, emotional disorders, and emotion regulation deficits contribute to the development and maintenance of chronic pain problems that lack clear, peripheral, biological causes. This study examined the effectiveness of an innovative, emotion-focused treatment that directly targets patients' unresolved stress and emotional avoidance and sought to identify predictors of treatment outcome. Additionally, this study explored the effects of a novel, emotional assessment on treatment outcome by randomizing half of the participants to complete this assessment prior to treatment.

To be included in the study, patients reported chronic pain for at least 3 months duration that had substantial psychological factors that contributed to the pain. Forty-six patients participated (76% women and 91% Caucasian). Pain, pain-related disability, depression, general emotional distress, and satisfaction with life were assessed at

baseline, post-treatment, and a 3-month follow-up. Stressful life events and emotion regulation ability were also assessed at baseline. The 4-session group treatment uses readings, writing about emotions, meditation, and other techniques to help people identify, understand, and verbalize emotions related to stressful life events or emotional conflict.

Results indicated significant improvements for pain, pain-related disability and acceptance, depression, general emotional distress, and satisfaction with life. Effect sizes were generally medium or large and reliable change analyses indicated that approximately half of the patients showed at least a moderate effect across all the outcome domains. Increased levels of baseline depression and stress generally predicted improved treatment outcomes, whereas poorer baseline emotion regulation predicted inconsistent results. The baseline emotional assessment had no significant effect on the outcome measures. This study suggests that this emotion-focused treatment led to substantial improvements in pain, pain-related functioning, and emotional symptoms. Further research should seek to clarify the predictors of treatment outcome and the process by which it works.

AUTOBIOGRAPHICAL STATEMENT

Amanda Burger graduated from Cedarville University with a Bachelor's degree in Psychology in 2004 and began the Clinical Psychology doctoral program at Wayne State University in the fall of that year. While at Wayne State, Amanda has had numerous opportunities to develop her interest in health psychology through teaching, clinical work, and research experiences. She will complete her internship at the Louis Stokes Cleveland VA Medical Center in August of 2010 and will start as Assistant Professor at Cedarville University in the fall. In her free time, Amanda enjoys spending time with her friends, family, and her Chihuahua Pearl. Additionally, she loves to read, shop, and decorate. Amanda looks forward to teaching at her alma mater and to continue clinical work in the field of health psychology.