

Emotion Inhibition and Relationship Satisfaction in the Context of the Communal Coping
Model

by

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Abstract

Pain is highly costly in terms of its economic, psychological, and social impact. The biopsychosocial approach to pain serves as a framework to explain aspects of the “pain experience” that cannot be accounted for by purely medical models. Psychological aspects of pain such as maladaptive emotion management styles (e.g., thought suppression and ambivalence over emotional expression), as well as catastrophizing have been linked to poorer pain outcomes, but few studies have examined these factors in an interpersonal context. The Communal Coping Model asserts that within an interpersonal setting, catastrophizing may serve a communicative function to elicit support from one’s partner, but it is unknown how emotion management may impact this association. Therefore, the current study examined the effect of emotion inhibition, catastrophizing, and relationship satisfaction in the context of acute experimental pain. Fifty undergraduate participants at the University of Michigan-Dearborn completed a cold-pressor task in the presence of their partner, as well as several self-report measures. While some expected associations among study variables were not found, analyses revealed that relationship satisfaction moderated the relationship between thought suppression and catastrophizing. Findings from the study offer support for the Communal Coping Model, in that when using a maladaptive coping strategy such as thought suppression, an individual in pain may engage in catastrophizing in an interpersonal context, especially when they feel satisfied with their partner as they may be more likely

to believe they would receive support as a result. This study affirms the importance of interpersonal variables in the pain experience and subsequent coping efforts.

Chapter I

Introduction

Pain is the number one reason why individuals seek health care and accounts for 80% of physician visits (American Pain Society, 2000; Gatchel, 2004). A review of 15 studies found that chronic pain (pain that extends for a minimum of 3-6 months) is believed to affect 2% to 40% of adults, with a median point prevalence of 15% (Verhaak, Kerssens, Dekker, Sorbi, & Bensing, 1998). Persistent pain has a large impact on an individual's ability to function in their everyday life; pain is the second leading cause of work absenteeism, the leading cause of disability in the working age population, and accounts for more than 50 million lost workdays annually (American Pain Society, 2000). In addition to disability, individuals in pain may experience a number of distressing psychological conditions, including mood disturbances and increased stress (Davis, Zautra, & Smith, 2004). Interpersonally, pain is associated with social withdrawal, strained intimate relationships, loss of family roles, and difficulty being believed or understood by others (Closs, Staples, Reid, Bennett, & Briggs, 2009). These complications come with a heavy financial burden; in the U.S., chronic pain is estimated to cost \$560 to \$635 billion annually, exceeding the costs of other prevalent diagnoses such as cardiovascular diseases, metabolic diseases, and respiratory diseases (Gaskin & Richard, 2012). In light of the heavy costs associated with pain, pain management has increasingly become a large topic of research. Despite the availability of analgesics, pain

under treatment remains a large problem in the healthcare community (Wells, Pasero, & McCaffery, 2004); this suggests medical methods alone such as analgesics are not enough to fully relieve pain, as medications alone do not address psychosocial aspects of the pain experience. In recent years, pain management techniques have gone beyond directing treatment at pain alone, instead taking a more comprehensive approach to effectively manage pain.

Biopsychosocial Approach to Pain

From a traditionalistic view of pain, the mind and body are independent entities that function separately. In this view, pain is a purely biological process that alerts the body to potential tissue damage; therefore, pain should be proportional to the amount of tissue damage, with more tissue damage resulting in greater amounts of pain. Keefe and France (1999) note one key limitation to this model of pain; pain is often not proportional to level of tissue damage. For example, amputees can experience pain in phantom limbs, and soldiers in high-stress combat may not experience any pain from severe wounds (Keefe & France, 1999; Melzack, Coderre, Katz, & Vaccarino, 2001). Therefore, a simple physiological model of pain cannot account for the full pain experience.

While seeking alternative models of pain, one important distinction to consider is the difference between nociception and pain. Nociception is caused by the activation of sensory neurons in the peripheral nervous system. This activation signals the occurrence, location, duration, type, and severity of the harmful stimulus. Once the harmful stimulus is removed, nociception fades away. On the other hand, pain is the subjective experience that arises from nociception. According to Gatchel, Peng, Peters, Fuchs, and Turk (2007), the experience of pain is immediately associated with an emotional experience that is

typically negative. Next, cognitions bring about meaning to the experience that can activate other emotional responses and guide future responses to pain (Gatchel et al., 2007). For example, the sensation following intense exercise may be interpreted by an inexperienced individual as threatening and indicative of tissue damage (i.e., pain); in contrast, a more experienced athlete may interpret this same sensation as a pleasurable “burn” (Garland, 2012). Further, studies following patients after a surgical procedure find individual factors such as stress, anxiety, depression, poor coping abilities, and other individual factors are some of the best predictors of post-surgical pain levels (Gerbershagen et al., 2009; Hinrichs-Rocker et al., 2009; Ip, Abrishami, Peng, Wong, & Chung, 2009). Due to the effect of individual factors, the experience of the same injury can be drastically different for two people.

In accordance with the Gate Control Theory of Pain proposed by Melzack and Wall (1967), the experience of pain is modulated by a variety of factors including prior experience with pain, attentional states, expectations of pain relief, attitudes, suggestion, and emotional context (Bushnell, Ceko, & Low, 2013; Gatchel et al., 2007). Following afferent pain input, various descending modulatory pathways are affected by attentional and emotional factors; for example, increased attention and negative emotional states can exacerbate pain sensations, while decreased attention and positive emotional states can attenuate the experience of pain (Bushnell et al., 2013). Afferent pain signals are not directly felt, but instead are processed and modulated through various pathways that ultimately produce the pain experienced by the individual. This distinction between nociception and pain, two seemingly identical concepts, suggests that while biological

factors are important in understanding pain, psychosocial factors are necessary considerations when attempting to capture the full pain experience.

According to the biopsychosocial model, pain results from a complex interaction of physiological, psychological, and social mechanisms that can maintain and exacerbate pain presentation (Gatchel et al., 2007). Not only do these factors influence the pain process, but the experience of pain can create biological, psychological, and social changes in that individual, which in turn can further affect the pain experience (Keefe & France, 1999). A brief discussion of each of these components and how they impact the pain experience is in the following sections.

Biological factors. Various biological theories of pain have emerged over time, beginning with strict mind-body dualism from Descartes to models that incorporate the “mind” as an important factor in biological mechanisms of pain; one such model is the neuromatrix theory of pain. In this model, the pain experience is determined by a brain mechanism, known as the neuromatrix, that comprises a network of neurons that produce a distinctive pattern of impulses that produce sensations within the body (Melzack & Katz, 2006). Pain is determined by the synaptic architecture of the neuromatrix, which can be modulated by sensory, genetic, and cognitive influences, such as stress. In the case of prolonged homeostatic irregularities like those seen in extreme stress, the neuromatrix gives rise to the destructive neuroplastic changes that can result in chronic pain syndromes (Melzack, 2001).

Persistent pain has been associated with neuroplastic changes in the nervous system, particularly pathways responsible for the transmission and perception of pain signals. Such neuroplastic changes include a reduced threshold of nociceptors or

increased excitability in central nervous system neurons involved in pain transmission (Coderre, Katz, Vaccarino, & Melzack, 1993). These changes can result in reduced pain threshold, enhanced pain response, spread of pain to undamaged tissue, increased spontaneous pain activity, and a longer duration of pain (Coderre et al., 1993; Lumley et al., 2011). One salient example of the effect of repeated pain exposure on the nervous system is the case of neonates kept in an NICU following birth. While in an NICU, neonates are repeatedly exposed to painful procedures. Compared to age-matched controls, children kept in the NICU tend to display long-lasting changes to neural pathways that respond to pain (Victoria & Murphy, 2016). Specifically, these infants tend to display hypersensitivity to tonic pain and hyposensitivity to mechanical and cutaneous thermal pain (van den Hoogen et al., 2016). Beyond infancy, other events including injury can drive neuroplastic changes in pain processing pathways. Following an injury, damage to relevant structures leads to an inflammatory response that hypersensitizes local peripheral nociceptors. With continued inflammation and hypersensitization, these nociceptors display reduced thresholds and hyperresponsivity to pain signals (Hush, Stanton, Siddall, Marcuzzi, & Attal, 2013).

Social factors. Given that both stress and persistent pain can drive neuroplastic changes, inclusion of psychosocial factors that influence pain or levels of stress in patients struggling with pain is crucial to understanding this condition and its management. Persistent pain is associated with a number of adverse social changes, including social withdrawal and feelings of frustration about not being understood or believed regarding one's pain (Closs et al., 2009). Social losses, particularly role loss (e.g., job), are associated with psychological distress and adjustment problems in chronic

pain patients (Harris, Morley, & Barton, 2003). An onset of a pain condition is often associated with changes in relationship satisfaction (Flor, Turk, & Scholz, 1987). Further, a review of literature on chronic pain in couples found changes in marital satisfaction were consistently related to changes in psychological distress in individuals in chronic pain (Leonard, Cano, & Johansen, 2006). More importantly, for individuals in pain, social connectedness may be one of the most important predictors of overall functioning (Sturgeon, Dixon, Darnall, & Mackey, 2015).

While pain is often viewed as a private experience, it has been suggested that other people can influence the person's pain experience (Romano, Jensen, Turner, Good, & Hops, 2000). Consistent with an operant model of pain, a spouse may respond to pain behaviors in a solicitous manner, offering assistance or taking over chores normally completed by the individual in pain. When spousal responses to these pain behaviors hold a positively reinforcing value for the individual (i.e., taking over chores), the spousal responses increase the likelihood the individual will continue to display those pain behaviors (Fordyce, 1982). Solicitous behaviors from spouses are associated with increased pain perception, pain behaviors, and disability in the pain patient (Flor, Breitenstein, Birbaumer, & Fürst, 1995; Romano et al., 1995). While the solicitous spouse may act in aim to reduce their partner's discomfort, their solicitous behaviors can ultimately worsen the pain condition.

On the other hand, social support can provide a protective effect during painful experiences. According to (Cobb, 1976), social support is information that leads to an individual believing he or she is loved and cared for, is valued, and is a member of a social network that provides "mutual obligations". In studies utilizing an experimental

pain task, participants who received active social support from another individual displayed attenuated physiological responses and pain intensity ratings, as well as increased pain thresholds compared to participants who did not receive social support (Roberts, Klatzkin, & Mechlin, 2015). Further, the buffering effects of social support exist regardless if the person giving support is a stranger, friend, or loved one (Thorsteinsson & James, 1999).

Because clear causal and temporal associations between couples' functioning, pain, and psychological distress have yet to be elucidated, researchers have looked to the literature on depression and interpersonal functioning, suggesting pain may operate in similar manner. Beach's marital discord model of depression postulates depression may arise as the result of changes in marital satisfaction, which in turn lead to loss of social support (Beach, Sandeen, & O'Leary, 1990); these processes likely also occur in couples with a member in pain (Leonard et al., 2006). Beach and colleagues completed a follow-up study on his marital discord model, finding that chronically dysphoric individuals were more likely to be reactive to relationship changes (Beach & O'Leary, 1993); within a pain context, individuals experiencing pain-related distress may be more affected by relationship-related distress as well. Together, these findings suggest the association between the experience of pain, relationship functioning, and distress is complex, and these factors warrant investigation in pain research.

Psychological factors. The role of psychological factors in the pain experience can readily be seen in descriptions of pain, which typically include accounts of the unpleasantness and emotional experience of the pain (Gatchel et al., 2007). Most often, affective components of the pain experience are negative and can include depression,

anxiety, and anger (Gatchel et al., 2007). Numerous studies have found severe pain is associated with increased psychological distress, which in turn can diminish quality of life and interfere with effective treatment (i.e., Gatchel, 2004; McBeth, Macfarlane, & Silman, 2002; Roth, Lowery, & Hamill, 2004). Distress may affect pain outcomes through the development of disability in which chronic pain patients have negative views about their ability to function with their pain; these individuals ultimately overly restrict their behavior due to their current pain levels and out of fear of creating further tissue damage (Banks & Kerns, 1996). In one prospective study, levels of affective distress at baseline and follow-up independently predicted worse pain outcomes and disability in spinal surgery patients (Edwards et al., 2007). Thus, affective dimensions of pain appear to play a significant role in the pain experience.

Negative affect. As previously mentioned, severe pain is associated with increased psychological distress, particularly affective distress. Depression, characterized by high levels of negative affect and low levels of positive affect (Watson, Clark, & Carey, 1988), is highly prevalent in chronic pain patients, with an estimated 30% to 50% of all chronic pain patients currently experiencing depression (Banks & Kerns, 1996). Anxiety, neuroticism, and anger have also been shown to significantly contribute to affective distress experienced while in pain (Gaskin & Richard, 2012; Wade, Price, Hamer, Schwartz, & Hart, 1990), and interventions aimed at reducing negative affect have been used in chronic pain management (Davis et al., 2004). In clinical studies, levels of negative affect are predictive of poorer pain-related outcomes, such as disease progression and greater pain intensity (Affleck, Tennen, Urrows, & Higgins, 1992; Breslau, Chilcoat, & Andreski, 1996). This effect is also seen in experimental settings;

inductions of negative mood lead to lower pain tolerance and increased reporting of pain symptomology (Breslau et al., 1996; Salovey & Birnbaum, 1989).

Cognitions. Affective distress is believed to modulate the pain experience in part by influencing cognitions (Lumley et al., 2011). A number of maladaptive cognitions have been associated with increased pain levels and poorer adjustment, including pain-related fear (Kirwilliam & Derbyshire, 2008), pain-related anxiety (Keefe, Rumble, Scipio, Giordano, & Perri, 2004), and insecure attachment styles characterized by negative appraisals of pain (McWilliams & Asmundson, 2007; Meredith, Strong, & Feeney, 2006). These cognitions can arise as part of the pain response, and can also elicit, maintain, and exacerbate pain (Lumley et al., 2011). In response to the distress associated with pain, individuals may take effortful steps to try and decrease their negative emotionality.

As pain becomes chronic in nature, it can affect an individual's beliefs about pain, coping efforts, and sense of control over their pain (Keefe & France, 1999). Cognitive-based coping strategies have been shown to moderate an individuals' adjustment to pain; the use of specific coping strategies can either decrease, exacerbate, or have no effect on pain (Brown, Nicassio, & Wallston, 1989). A full review of the pain coping literature is beyond the scope of this thesis; this thesis will instead highlight passive-coping strategies. Passive-coping strategies aim at reducing negative emotions related to pain, but are typically associated with poorer adjustment to pain (Smith, Lumley, & Longo, 2002). The literature has identified several passive coping strategies including praying, avoidance, minimizing, and pain catastrophizing (Peres & Lucchetti, 2010; Snow-Turek, Norris, & Tan, 1996). Although it is debated if pain catastrophizing is a "coping" strategy

per say (Sullivan et al., 2001), it shares many of the qualities typically thought of as passive coping.

Catastrophizing

Catastrophizing in the context of pain has been described as a negative cognitive response style during an actual or anticipated pain experience (Sullivan et al., 2001). As a construct, pain catastrophizing consists of three dimensions: helplessness, magnification, and rumination. Helplessness refers to an overly pessimistic view on one's ability to deal with pain, magnification is an exaggerated negative view of the pain experience and outcomes, and rumination reflects an inability to suppress pain-related thoughts (Sullivan, Bishop, & Pivik, 1995). Catastrophizing cognitions can include an exaggerated threat appraisal of the pain, feelings of helplessness, and a decreased ability to inhibit pain-related thoughts (Quartana, Campbell, & Edwards, 2009). These cognitions are rooted in attentional biases affective and sensory pain cues that amplify the experience of pain (Fallon, Li, & Stancak, 2015). Interestingly, these biases for pain-related information reflect those found in depression and anxiety (Quartana et al., 2009).

Pain catastrophizing has been consistently associated with greater levels of pain in acute pain conditions, such as experimental pain tasks and surgery (Pavlin, Sullivan, Freund, & Roesen, 2005; Weissman-Fogel, Sprecher, & Pud, 2008), as well as persistent pain conditions including rheumatoid arthritis, osteoarthritis, and fibromyalgia (Edwards, Bingham, Bathon, & Haythornthwaite, 2006). In postsurgical pain, a patient's level of pain catastrophizing can be used to predict postsurgical pain levels, independent of anxiety levels (Granot & Ferber, 2005; Pavlin et al., 2005). Catastrophizing has been shown to account for 7-31% of the variance in pain ratings (Sullivan et al., 2001).

Beyond levels of pain, catastrophizing has been associated with increases in pain-related disability and pain behaviors (Severeijns, Vlaeyen, van den Hout, & Weber, 2001; Sullivan, Stanish, Waite, Sullivan, & Tripp, 1998; Sullivan, Tripp, & Santor, 2000). Additionally, higher levels of catastrophizing are predictive of increases in depression in patients, as well as higher levels of distress in their partners (Edwards et al., 2006). One study established a causal role of catastrophizing in pain outcomes by demonstrating the mediating role of catastrophizing in the success of behavioral interventions for chronic pain (Smeets, Vlaeyen, Kester, & Knottnerus, 2006). Catastrophizing is hypothesized to produce negative pain outcomes by generating negative affect, helplessness, and alteration of neural pathways related to pain perception, attention, and behavioral responses (Lumley et al., 2011).

As mentioned above, a debate exists in the literature as to if catastrophizing should be conceptualized as a cognitive response style or a coping strategy. According to the Transactional Theory of Stress (Lazarus & Folkman, 1984), coping refers to behavioral and cognitive efforts to meet the demands of a demanding event. Based on this definition of coping, some researchers have argued that catastrophizing should not be seen as a coping strategy. They argue because catastrophizing is not always associated with a direct attempt to reduce pain, perhaps catastrophizing would be better conceptualized as a maladaptive cognitive strategy (Severeijns, Vlaeyen, & van den Hout, 2004; Sullivan et al., 2001; Turner, Jensen, & Romano, 2000). However, the views of catastrophizing as a coping response or a cognitive strategy may not be mutually exclusive; Cano (2004) suggests catastrophizing can simultaneously serve a communicative function and worsen psychological distress.

Sullivan et al. (2001) argues even though the goal of catastrophizing is not always pain reduction, its coping function should not be dismissed. For example, if relational, instrumental, or caregiving goals are primary for the pain patient, coping efforts may result in increased pain or emotional distress; if a chronic pain patient performs taxing household chores in an effort to avoid burdening her ill husband (caregiving goal), she will likely experience increased pain (Sullivan et al., 2001). Further, it has been hypothesized that with threat appraisals of pain, more passive coping strategies may be employed with the aim of giving control to another person (Ramírez-Maestre, Esteve, & López, 2008). The goals of catastrophizing may be broader than pain reduction, and may include aspects of coping aimed at achieving specific interpersonal goals.

Communal coping model. Sullivan and colleagues (2001) put forth the Communal Coping Model to help researchers and clinicians further understand pain catastrophizing as a coping response in a social context. This model suggests that individuals engage in pain catastrophizing in an effort to elicit support from close others (e.g., relationship partners), rather than simply attempting to reduce the pain experience (Keefe et al., 2003; Sullivan et al., 2001). According to this model, individuals engage in catastrophizing in an attempt to cope within a social context, knowing that displaying pain behaviors or engaging in overt pain catastrophizing will likely elicit a response and/or support from close others (Keefe et al., 2003). The communal coping model explains the increased pain behaviors seen in catastrophizing individuals from an operant context. Because catastrophizing stems from an appraisal that the pain is threatening and exceeds current coping resources, these threat appraisals are related to an increase in pain behaviors (Severeijns et al., 2004). These pain behaviors may serve to alert spouses

(particularly those that engage in solicitous responses) that support is needed (Romano et al., 2016). Increased attention and support from spouses may reinforce these pain behaviors, ultimately heightening the pain experience. This in turn may promote more pain behaviors, as well as increased in perceived disability (Sullivan et al., 2001). The negative effects of communal catastrophizing is supported by findings suggesting a stronger association among pain and catastrophizing for individuals that lived with a partner or spouse (Giardino, Jensen, Turner, Ehde, & Cardenas, 2003)

The communal coping model asserts that if indeed the goal of catastrophizing is to elicit support from their partners, catastrophizers must have the ability to effectively and accurately express their cognitive processes and emotional distress (Sullivan, 2012); however, catastrophizers are not always able to express emotion in an adaptive manner, exacerbating existing distress (Gilliam, Burns, & Wolff, 2010). Duration of one's pain may also play a role in the effectiveness of catastrophizing as a coping strategy. Cano (2004) suggested that catastrophizers in an early stage of pain may seek social support to help reduce pain. As time progresses, the partners may habituate to the catastrophizers' behaviors, and the catastrophizers to their partners' support behaviors. With this, the partner may become irritated and adopt more negative and punishing response styles (Cano, 2004). Keefe et al. (2003) found that among gastrointestinal cancer patients, high catastrophizing patients reported receiving more instrumental support from their caregiver. Interestingly, this effect was not seen for emotional support. Caregivers of catastrophizers may respond to their spouse's catastrophizing behaviors by providing more tangible support, while the catastrophizer is seeking an emotional response from

their partner. Thus for some, catastrophizing within the context of a relationship may not be an effective strategy for managing pain-related distress.

Emotion Management and Regulation

As previously mentioned, emotions are an integral part of the pain experience, and their management can largely shape an individual's pain outcomes. From a behavioral perspective, an emotion can guide the individual into engaging in an appropriate behavior in response to a particular situation. However, expressing emotions in certain situations can be perceived as disadvantageous. Research on the association between pain and emotion has covered a variety of emotion processes, including emotion awareness, expression, and experience. Evidence suggests that emotion awareness, expression, and processing (sometimes referred to as emotion regulation) are considered adaptive coping practices for individuals in pain (Lumley et al., 2011). On the other hand, actively inhibiting one's emotions can lead to increased physiological arousal and in the long-term, stress-related disease (Pennebaker, 1985).

Emotion regulation employs behavioral, physiological, and experiential mechanisms that result in changes in the timing, duration, and magnitude of responses, as well as how these responses change and interact as a function of expression or inhibition (Gross, 2002). In the pain literature, two emotion regulation mechanisms are notable. The first mechanism is the ability to be aware of and identify emotion, and the second is whether emotion is expressed or inhibited (Keefe et al., 2001); this thesis will focus on the latter although a brief review of the emotional expression in the context of pain is provided.

In terms of emotional expression, the majority of research has involved the practice of emotional disclosure, which involves writing or talking about stressful emotions and experiences over multiple sessions (Lumley et al., 2011). Disclosure is believed to improve well-being because it allows for release of undesirable cognitions, understanding of distressing events, regulation of emotions, adaptation to negative emotions, and reinforcement of social connections (Frattaroli, 2006). One meta-analysis found that emotional disclosure was found to improve an individuals' physical health, mental health, and overall wellbeing (Frattaroli, 2006). However, emotion disclosure may only benefit certain individuals, such as those with unresolved stress and those who engaged in maladaptive emotion regulation strategies, such as avoidance or suppression (Lumley et al., 2011). These individuals are less likely to engage in emotional disclosure in everyday communication.

Those who engage in maladaptive emotion regulation strategies, such as emotional inhibition, perceive less social support from their partners and may feel close others do not believe they are indeed in pain; as a result, may be less likely to engage in appropriate and effective disclosure to close others (Closs et al., 2009).

Emotional inhibition. Emotion inhibition involves the inhibition of emotional experience and expression during emotional arousal (Consedine, Magai, & Bonanno, 2002). The goal of emotion inhibition is to respond to the emotion, which in the context of this study is the emotional response to pain, in a manner that limits distress while enhancing positive affect (Polivy, 1998). Lynch, Robins, Morse, and Krause (2001) found the association between negative affect intensity and acute psychological distress is mediated by emotion inhibition. A possible explanation for this association is that with

high levels of negative affect intensity, emotion inhibition strategies may be used as a technique to temporarily suppress negative emotional arousal. However, repeated inhibition of emotional expression and thought suppression actually exacerbates arousal over time, resulting in increased negative affect (Lynch et al., 2001).

Emotion inhibition has also been studied in the context of chronic pain. A review of both clinical and experimental studies by Keefe et al. (2001) indicates chronic pain patients who do not respond to typical forms of treatment tend to display higher levels of anger inhibition, and individuals instructed to suppress their emotions during an experimental pain task later reported higher levels of pain than those not instructed to suppress. In order to further understand the relevance of emotion inhibition to pain outcomes, a further discussion of emotion inhibition is warranted. This thesis will view emotion inhibition as operationalized by (Lynch et al., 2001), comprising of two variables: thought suppression and ambivalence over emotional expression.

Thought suppression. Thought suppression is characterized by an attempt to direct attention away from a specific thought in effort to avoid a negative emotional experience (Lynch et al., 2001). After the activation of an emotion, thought suppression may occur in effort to reduce the behavioral expression of the emotion. However, the accompanying subjective experience and physiological arousal are not reduced, but in fact may be enhanced (Gross & Levenson, 1993). Individuals consciously search for distractors, looking to think about “anything but” the thought targeted for suppression. Unconsciously, the mind is highly sensitive to the topic of the thought targeted for suppression, creating a monitoring process that increases the cognitive availability of that thought (Wegner, Schneider, Carter, & White, 1987; Wegner & Zanakos, 1994). With

this, an ironic process occurs that increases occurrences of the thought targeted for suppression.

Experimental studies on active thought suppression have found individuals instructed to suppress target thoughts report an increased frequency in target thoughts, as well as increased levels of distress and an “urge to do something” in response to these thoughts (Hooper & McHugh, 2013; Marcks & Woods, 2005). In addition, those who are not as accepting of their intrusive thoughts are more likely to have depressive, obsessional, and anxious tendencies (Marcks & Woods, 2005). Within the context of pain, individuals who attempt to suppress pain-related thoughts during an experimental pain task tend to report increases in pain intensity, pain severity, and physiological arousal compared to individuals who did not engage in suppression (Burns, 2006; Cioffi & Holloway, 1993; Sullivan, Rouse, Bishop, & Johnston, 1997). Individuals in pain who attempt to suppress pain-related thoughts and feelings indeed appear to display a paradoxical pattern of poorer pain outcomes, thus affirming the notion of suppression as an ineffective emotion-regulation strategy (Gilliam et al., 2010).

Ambivalence over emotional expression. Ambivalence over emotional expression (henceforth referred to as ambivalence) is an attempt to manage the external expression of the experience of emotions, both positive and negative, and is characterized by an internal conflict regarding the expression of emotions (King & Emmons, 1990). King and Emmons (1990) proposed three forms of ambivalence; (1) wanting to express, but actively inhibiting expression, (2) expressing, but feeling reluctant about doing so, and (3) expressing and then later regretting doing so. While the expression or inexpression of emotions is not inherently healthy or unhealthy, the conflict regarding expression

underlying ambivalence is believed to be at the root of poor physical and psychological outcomes (Katz & Campbell, 1994; King & Emmons, 1990). Ambivalent individuals report more depression (Lu, Uysal, & Teo, 2011), psychological distress (Katz & Campbell, 1994), low self-esteem (King & Emmons, 1990), and physical symptomology (King & Emmons, 1991). Additionally, ambivalence is associated with negative perceptions of social support, use of avoidant coping strategies, and less seeking of social support (Emmons & Colby, 1995).

The use of ambivalence by individuals in pain is associated with increases in self-reported pain (Lu et al., 2011), increases in pain-related behaviors, lower energy levels, and poorer overall health (Porter, Keefe, Lipkus, & Hurwitz, 2005). With this, it is not surprising that ambivalence has been linked to poorer pain outcomes in numerous conditions, including chronic lower back pain (Carson et al., 2007), rheumatoid arthritis (Tucker, Winkelman, Katz, & Bermas, 1999), and cancer (Porter et al., 2005). Due to the conflict experienced over whether or not to express emotions, ambivalent individuals may choose to focus on their physical symptoms, instead of their emotions. This increased focus on physical symptoms is associated with worsened pain outcomes and lessened perceived coping ability (Porter et al., 2005). Additionally, individuals in pain, especially those with unexplained causes of their pain, are likely to feel frustrated and angry with their current care. Due to the potential negative consequences associated with their expression of negative affect, such as abandonment by treatment providers, these individuals may be more likely to feel ambivalent about expressing their emotions associated with their care (Carson et al., 2007).

As described above, the components of emotion inhibition have both been shown to be directly associated with adverse pain outcomes. However, research (i.e., Gilliam et al., 2010; Lu et al., 2011; Porter et al., 2005) has shown the association between emotion inhibition and pain is influenced by additional psychosocial factors discussed earlier; one such factor is the emotion-focused coping strategy catastrophizing.

Integration of Constructs

Emotion inhibition and catastrophizing. Catastrophizing has been found to be a play a role in the relation between pain and both components of emotion inhibition: ambivalence and thought suppression. A study completed by Lu and colleagues not only found that ambivalence was associated with increased pain and depressive symptoms; but they also found that catastrophizing fully mediated the association between pain and ambivalence (Lu et al., 2011). The association between thought suppression and catastrophizing was examined in a study by (Gilliam et al., 2010); results revealed individuals characterized by both high pain catastrophizing and high thought suppression reported greater pain and distress during the recovery period following an acute pain procedure. Further, high catastrophizers who did not engage in thought suppression had similar pain and distress levels as low catastrophizers. This suggests that the use of thought suppression by high catastrophizers is a maladaptive strategy to cope with negative emotional experiences brought on by acute pain (Gilliam et al., 2010). Although this information is useful and can be informative to both clinicians and research; there are only a few studies that have examined the association in an interpersonal context. This is alarming given the importance of interpersonal relationships in pain (Leonard et al., 2006).

Emotion inhibition and the communal coping model of catastrophizing. Some studies have suggested a link between ambivalence and pain catastrophizing within a communal coping framework. Emmons and Colby (1995) found the association between ambivalence and wellbeing is mediated by perceived social support. Because ambivalent individuals are more likely to have negative perceptions of social support provided by their spouses, they may be more likely to use maladaptive coping strategies such as catastrophizing, which in turn can result in increased distress. Lu et al. (2011) suggested that in accordance with the communal coping model of catastrophizing, individuals high in ambivalence are less able to articulate their distress. Instead, they may somatize emotional distress and display excessive pain behaviors, expressing their distress via pain behaviors instead of emotional expression (Lu et al., 2011). These exaggerated pain behaviors in turn can result in increased pain (Sullivan et al., 2001). However, these suggestions from Lu and colleagues were mostly theoretical, as the study did not include measures to assess interpersonal processes.

Although not a main focus of the study, research has suggested emotion inhibition in spouses may have an effect on their partners' pain experience as well. That is, ambivalence may not only be an important factor in the patient, but the spouse as well. A 2005 study by Porter and colleagues found that (1) patients of caregivers high in ambivalence reported higher levels of pain, more pain behaviors, and poorer emotional well-being; (2) patients with caregivers high in ambivalence engaged in more catastrophizing; (3) dyads with high ambivalence in both the caregiver and patient reported the worst pain outcomes (Porter et al., 2005). Tucker and colleagues reported similar findings; highly ambivalent rheumatoid arthritis patients with highly ambivalent

spouses reported the highest levels of psychological distress (Tucker et al., 1999).

Together, these findings highlight the importance of emotions in catastrophizing in an interpersonal setting.

Research has been limited on the role of thought suppression in the communal coping model. Within an interpersonal context, thought suppression has been linked with poorer mood in both the suppressor and their partner (Debrot, Schoebi, Perrez, & Horn, 2014). Because thought suppression exhausts cognitive abilities (Wenzlaff & Wegner, 2000), suppressors may be less likely to effectively express their pain-related emotions to their partner, and less able to inhibit negative expressions toward their partner (Debrot et al., 2014). Similar to highly ambivalent individuals, suppressors may be more likely to express their distress via pain behaviors rather than through emotional expression, as it may require less cognitive resources.

The Present Study

As described, the literature has established associations between catastrophizing, in both a personal and interpersonal context, and poorer pain outcomes. Additionally, poorer relationship satisfaction has been linked to more negative pain outcomes. Finally, emotion inhibition strategies (ambivalence over emotional expression and thought suppression) as well as negative affect have been associated to poor pain outcomes, with that association mediated by catastrophizing. However, no published study to date has examined the possible associations between emotion inhibition, negative affect, catastrophizing, and relationship satisfaction within the context of the communal coping model of catastrophizing, effectively pulling all of these pieces together.

Given that increases in negative affect, catastrophizing, and emotion inhibition have all been associated with both increased distress and poor pain outcomes (Affleck et al., 1992; Cioffi & Holloway, 1993; Lu et al., 2011; Sullivan et al., 2001), it is hypothesized that each of these factors will independently associate with poorer pain outcomes; specifically, those high in negative affect that engage in emotion inhibition and catastrophizing cognitions will have the worst pain outcomes. Emotion inhibition is believed to be a maladaptive coping strategy to deal with excessive negative affect (Polivy, 1998); therefore, increases in emotion inhibition should be associated with increases in negative affect related to pain. Similarly, emotion inhibition is believed to be a strategy employed by high catastrophizers in order to deal with the distress accompanying pain (Gilliam et al., 2010; Lu et al., 2011); therefore, increases in catastrophizing are expected to be associated with increases in emotion inhibition strategies. Additionally, distress in relationships is related to poor pain outcomes and negative affect, and in turn, pain conditions can result in interpersonal distress (Cano, Weisberg, & Gallagher, 2000). Therefore, it is reasonable to theorize that relationship satisfaction will affect the associations between emotion inhibition and negative affect, and emotion inhibition and catastrophizing. Finally, in accordance with the findings of Lu et al. (2011) and Gilliam et al. (2010), catastrophizing is expected to mediate the association between emotion inhibition and pain outcomes.

The purpose of the present study is to examine the associations between negative affect, emotion inhibition, and catastrophizing in an acute pain setting. Additionally, in accordance with the communal coping model, the study will also examine how these associations may be impacted by relationship satisfaction.

Hypotheses of the present study.

Hypothesis 1: *Independently, change in negative affect (measured as the change in PANAS Negative Affect scores between time 2 and time 1 distribution), catastrophizing, and emotion inhibition (as measured by AEQ and WBSI) will all have a positive association with pain outcomes (as measured by time on the cold pressor task and change between VAS score between time 2 and time 1 distribution).*

Hypothesis 2: *There will be a positive association between emotion inhibition and change in negative affect, and the association will be moderated by relationship satisfaction.*

Hypothesis 3: *There will be a positive association between emotion inhibition and catastrophizing, and the association will be moderated by relationship satisfaction.*

Hypothesis 4: *There will be a positive association between emotion inhibition and pain outcomes, and the association will be mediated by catastrophizing.*

Chapter II

Methods

Participants

The sample for the current study consisted of 50 participants (24 female). This study was a part of a larger study assessing both interpersonal and relationship dynamics (e.g., attachment styles and relationship satisfaction) in response to acute pain. Although both couple members were involved in the data collection for the larger study, this study only utilized data from participant completing the cold pressor task. Due to the needs of the larger study, this study was only open to heterosexual couples that had been in a relationship for at least six months at their time of participation. Additionally, at least one member of the couple participating in the larger study was an undergraduate student at the University of Michigan- Dearborn enrolled in a behavioral science course. Prior to any data collection, the study was reviewed and approved by the IRB at the University of Michigan Dearborn.

Participants were recruited and screened via an online undergraduate participation system (SONA) within the University of Michigan- Dearborn. The SONA system informed students of available research studies on campus, and students were offered the opportunity to receive course credit for their participation. Participants had an average age of $M= 21.170$ years ($SD = 4.430$, range = 18 – 40) and identified as White ($n= 35$), Black ($n= 6$), Asian ($n= 4$), or Mixed/Other ($n= 5$). Eight participants did not

indicate their date of birth. In addition, participants had an average relationship duration of $M= 30.750$ months ($SD= 28.227$), and reported themselves as being married ($n= 4$), engaged ($n= 3$), or dating ($n= 43$) his or her partner.

Participants were excluded from the study if they had any history of cardiovascular disorders or diseases, fainting or seizures, frostbite on their hands, chronic pain. Additionally, participants were excluded if they had not something in the previous two hours before participation, had an open cut or sore on their non-dominant hand, were pregnant at the time of participation, had consumed caffeine in the previous two hours before participation, had taken any analgesic medications within 24 hours of the study (i.e., prescription, cold-medications, OTC medications), or had consumed alcohol in 12 hours previous to participation. Participants who did not meet the inclusion and exclusion criteria were dismissed from the study and given partial credit for their participation. There were an initial 51 couples recruited; of those, and none were excluded based on the exclusion criteria and one couple was dismissed by the researcher following an expected vasovagal reaction to the cold pressor task after the safety of the participant was addressed.

Apparatus

The cold pressor task consisted of a 38-gallon cooler of ice water. Ice was localized on one side of the divided cooler, with a pump continuously circulating water to maintain a temperature of 5°C .

Measures

Eligibility questionnaire. (Appendix A) The 10-item eligibility questionnaire was completed by all participants to determine if the individual was eligible to participate in the study based on the inclusion and exclusion criteria, as described above.

Demographics questionnaire. (Appendix B) All participants completed the demographics questionnaire, a 9-item questionnaire used to assess participant's age, weight, height, ethnicity, religion, relationship status, and length of current relationship with partner. It should be noted that some of these demographic variables were collected as part of the larger study.

Positive and negative affect schedule (PANAS) (1 & 2). (Appendix C) The Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) is a self-report measure containing 20 words that describe different positive and negative feelings and emotions. Participants rate their self-reported mood with a 5-point Likert scale (1 = very slightly or not at all, 2 = a little, 3 = moderately, 4 = quite a bit, and 5 = extremely). Positive and negative affect are distinct dimensions. Positive affect refers to the extent to which an individual is alert, active, and enthusiastic, while negative affect encompasses feelings of distress and a number of unpleasant mood states such as anger, disgust, fear, and nervousness (Watson, Clark, & Tellegen, 1988). The PANAS is believed to provide distinct measures of positive and negative affect (Crawford & Henry, 2004). This study asked participants to complete the PANAS on two separate occasions; the first PANAS was completed prior to the cold pressor task, and the second PANAS was completed after the cold pressor task and utilized the negative affect subscale. The PANAS has good internal consistency (Watson, Clark, & Tellegen, 1988). In the current study, Cronbach's

alpha for PANAS 1 assessing negative affect was .702 and for PANAS 2 assessing negative affect was .811. Two participants did not complete the second PANAS form due to an error by a research assistant. Scores were calculated for each subscale of the PANAS. In this sample for PANAS 1, the negative affect subscale had an average score of 14.360 ($SD= 4.085$), and for PANAS 2, the negative affect subscale had an average score of 13.896 ($SD= 4.834$). This study was interested in the effect the cold pressor task would have on participant's affect pre to post-cold pressor task, so a change score for each subscale between the second and first distribution of the PANAS was utilized for analysis. Larger change scores are indicative of an increase in affect (either positive or negative).

Visual analog scale (VAS) (1, 2 & 3). (Appendix D) This scale involves a 10-cm line with a written description of “no pain” on the left and “worst pain imaginable” on the right. The participant is asked to indicate their level of pain by marking a vertical line on the 10-cm line. This scale provides 101 levels to indicate pain, which reflects its sensitivity to detect change. The VAS is found to have good test-retest reliability in acute pain settings (Williamson & Hoggart, 2005). In this sample, scores for the VAS 1, 2, and 3 averaged at 5.500 ($SD= 12.011$), 56.400 ($SD= 22.686$), and 9.262 ($SD= 15.829$), respectively. An analysis of variance revealed there was a significant difference between the mean scores for the three VAS scales, $F(2, 48)= 110.193, p < .001$. Main effects indicated significant differences between mean pain ratings in VAS 1 and VAS 2 ($p < .001$), and between VAS 2 and VAS 3 ($p < .001$). No significant difference was found between VAS 1 and VAS 3 mean pain ratings. Because the change in pain rating prior to and just after the completion of the cold pressor task is of interest to this study, further

analyses utilized the mean change score between VAS 2 and VAS 1, henceforth referred to as VAS Δ . Larger VAS Δ scores indicate a higher pain rating following the cold pressor task relative to participants' pre-task pain rating.

White bear suppression inventory (WBSI). (Appendix E) The White Bear Suppression Inventory (Wegner & Zanakos, 1994) is a 15-item self-report measure assessing tendency to suppress unwanted thoughts. Using a 5-point scale, participants rated the extent to which they agree (1= strongly disagree, 5= strongly agree) with statements such as: "There are things I prefer not to think about" and "There are thoughts that keep jumping in my head". The WBSI has been found to have good internal consistency (Muris, Merckelbach, & Horselenberg, 1996). Higher WBSI scores indicate greater utilization of thought suppression. Further, the WBSI has been shown to have good predictive and convergent validity (Muris et al., 1996). Cronbach's alpha for the WBSI was .873.

Ambivalence over emotional expressiveness questionnaire (AEQ). (Appendix F) Individuals' expressive styles may be similar, but they may differ in their ambivalence over emotional expression. The Ambivalence Over Emotional Expressiveness Questionnaire (AEQ) uses a "personal striving" framework, and measures ambivalent emotional strivings. Ambivalence over emotional expression can occur in various forms such as, wanting to express but not being able to, expressing but not wanting to, and expressing emotions and later regretting the expression. The AEQ is a 28-item self-report measure assessing the conflict within the individual, between the desire to express information and what they actually do express, and higher mean scores indicate greater ambivalence. Psychometric studies have indicated a good internal consistency and

adequate test-retest reliability (King & Emmons, 1990). The Cronbach's alpha for this scale was .921.

Pain catastrophizing scale (PCS). (Appendix G) The 13-item Pain Catastrophizing Scale (Sullivan et al., 1995) has been used to measure exaggerated negative responses towards pain. The PCS measures three components of catastrophizing: rumination, magnification, and helplessness. These components have a stable structure (Sullivan et al., 1995; Van Damme, Crombez, Bijttebier, Goubert, & Van Houdenhove, 2002) and good reliability (Osman et al., 1997). The measure was adapted for use in the current study to reflect the participants' level of pain catastrophizing during the cold pressor task, with higher scores indicating greater use of catastrophizing. The Cronbach's alpha for the overall scale was .922, and the subscales for Rumination, Magnification, and Helplessness were .908, .571, and .875, respectively. One participant did not complete the PCS. While the magnification subscale's alpha level is relatively low compared to the other subscales, it is consistent with the alpha levels found in other studies (e.g., Osman et al., 2000; Van Damme et al., 2002). One participant did not complete the PCS due to a research assistant's error.

Dyadic adjustment scale (DAS). (Appendix H) The 32-item DAS measures dyadic adjustment, determined by the degree of troublesome couple differences and tensions, personal anxiety, relation satisfaction and cohesion, and agreement on matters of relationship functioning (Spanier, 1976). The scale consists of items that measure agreement on a variety of topics (e.g., finances, world views), degree of affection, and general relationship happiness. The range of the scale is from 0-151 with higher scores indicating greater relationship satisfaction. Items on the DAS have been slightly modified

for use in the current study to be more inclusive of participants who may not be married, but are nonetheless in committed relationships (e.g., handling family finances was changed to handling finances). Psychometric tests report adequate reliability (Graham, Liu, & Jeziorski, 2006; Spanier, 1976). The Cronbach's alpha level for the DAS in this study was .872.

Procedure

The procedure described is for the larger study, but will give the reader context to how the data were collected and the cold pressor task was completed. Participants were recruited through the online undergraduate participation system (SONA) or through direct contact (i.e., email) with the research team. As mentioned previously, for the larger study, both couple members needed to be present in order to have participated in the study. If either couple member was not present the one partner was excused, not penalized in the SONA system, and asked to reschedule at a time where their partner would be able to attend. Each couple was given the option to reschedule their appointment one time, with explicit instructions (consistent with the eligibility criteria listed on the SONA advertisement) to ensure that both partners would show up for the appointment. If either one of the partners did not show again at the second time appointment time, the couple was given a "no show" in the SONA system, which prohibited the couple from signing up again. If the couple was recruited from another class in the behavioral sciences department and either partner did not show for more than one consecutive appointment, they were added to a "blacklist" and prohibited from

scheduling another appointment to participate. No participants in this study were added to the list.

In order to ensure the safety of participants, eligibility and screening was a two phase-process. Phase one was a verbal yes/no agreement that they had read the study description and met eligibility criteria using the script found on the pre-screen eligibility form (Appendix I). The answer was documented on the form and the couple proceeded with consent if answered affirmatively.

Each couple member was asked to complete their own consent form. Two consent forms were created for the study: one for participants who are engaging in the research study for SONA credit (see Appendix J) and another for couple members who are participating in the study to be helpful to their partner (see Appendix K). Couple members were asked if they were participating for SONA credit or not and were given the appropriate consent form. Research assistants monitored participants as they filled out the consent form, answered any questions that either couple member had regarding the study procedure, their rights as research participants, or consenting to participate in the study.

Following informed consent procedures each couple member was asked to fill out an eligibility form (Appendix A) and demographics forms (Appendix B). During this time, research assistants consulted with the pre-made random assignment list to see if male or female participant was to complete the cold pressor task. If the delegated “cold pressor” partner was ineligible to participate the couple was given the option to reschedule for another time or to take ½ a credit of research participation. If they chose to reschedule, they were given an alternative appointment time. If they did not show or were

still ineligible at that time, they were not given the opportunity to reschedule a second time.

The cold pressor task was explained to the participants by the research assistant (see Appendix L). Both couple members then completed the first PANAS and the cold pressor participant also completed the first VAS rating. Following the completion of the PANAS and VAS, the research assistant turned on the video equipment and began recording. The participant then placed their hand in the water and the research assistant began timing the task using a stopwatch. The research assistant was present in the room, but did not interact with the couple during the task. As soon as the participant's hand was removed, the research assistant documented the time the participant kept their hand in the water. The cold pressor participant was then immediately asked to complete the second VAS pain rating. The research assistant informed the participants that there would be an additional cold pressor task to be completed, and asked the participants to discuss their experiences during the task (see Appendix L). The researcher then left the room for 7 minutes, but monitored the couple through the two-way mirror in the laboratory to ensure safety.

After 7 minutes, the researcher came into the room and each partner was given the WBSI and AEQ. The research assistant informed participants that they had made a mistake (see Appendix L), and that the participant did not have to complete another cold pressor task. The couple member who completed the cold pressor task then completed the third VAS, and both partners completed the appropriate PCS (separate versions for each partner), DAS, and second PANAS. See Appendix L for an outline of the study procedures and distribution of measures.

Following completion of all the measures, the participants were debriefed (Appendix M) and excused from the study. No participants withdrew their data from the study.

Chapter III

Results

Data Screening

Prior to data analysis, item mean substitutions were utilized in the case of 21 missing data points. Data were also checked for normalcy and skew. There was not any significant issue with the distribution of the data found. In addition, data were checked and screened for univariate and multivariate outliers. Each of the measures had at least one univariate outlier. Multivariate outlier analysis, however, showed that there were seven multivariate outliers when all of the measures were included. Data analyses were run with and without the outliers present and there did not appear to be any appreciable differences in results and effects were in the same direction. Therefore, in order to preserve sample size the full dataset was utilized. Finally, no gender differences were found for the measures in this study.

Descriptives

As can be seen in Table 1, participants were on average 21 years old and they had been in their relationship on average two and a half years. It should be noted that one couple that participated reported that they had only been in a relationship for 5 months, but their data were nonetheless included to preserve the sample size. The average cold pressor time was just over a minute and a half, but it should be noted that 17 of the 50

participants kept their hand in the water for the entire time of the cold pressor task. As noted above a change score from time 1 to time 2 was used for the negative affect subscale of the PANAS. Comparison of the time 1 ($M = 14.375, SD = 4.087$) to time 2 ($M = 13.896, SD = 4.834$) for negative affect, however, did not show a significant change ($t = .848 (47), p = .40$).

Hypothesis 1: *Independently, change in negative affect (measured as the change in PANAS Negative Affect scores between time 2 and time 1 distribution), catastrophizing, and emotion inhibition (as measured by AEQ and WBSI) will all have a positive association with pain outcomes (as measured by time on the cold pressor task and change between VAS score between time 2 and time 1 distribution).*

The correlations between change in negative affect, catastrophizing, emotion inhibition, and pain outcomes are displayed in Table 2. Surprisingly, cold Pressor time was not significantly associated with any of the measures. VAS change scores, however, were positively associated change in negative affect and pain catastrophizing as was expected. The higher the level of pain that the participant reported from the cold pressor task, the greater their level of pain catastrophizing and the more their negative affect increased following the task.

Hypothesis 2: *There will be a positive association between emotion inhibition and change in negative affect, and the association will be moderated by relationship satisfaction.*

As seen in Table 2, there was a positive association between change in negative affect and thought suppression as measured by the WBSI, but this association was only marginally significant. In addition, relationship satisfaction did not significantly correlate with any of the variables. Moderation analyses revealed the associations between the emotion inhibition variables and change in negative affect were not moderated by relationship satisfaction (see Table 3).

Hypothesis 3: *There will be a positive association between emotion inhibition and catastrophizing, and the association will be moderated by relationship satisfaction.*

Correlations for emotion inhibition variables, catastrophizing, and relationship satisfaction are displayed in Table 2. There was a significant positive association between emotion inhibition variables and catastrophizing. Relationship satisfaction, unexpectedly, did not significantly correlate with any of the variables.

Hierarchical linear regressions were conducted to test for the moderating effect of relationship satisfaction on the association between emotion inhibition variables and catastrophizing, with a separate regression calculated for each emotion inhibition variable (thought suppression and ambivalence). As seen in Table 4, the association between AEQ and catastrophizing was not moderated by relationship satisfaction; however, relationship satisfaction did moderate the association between thought suppression and pain catastrophizing.

Post hoc probing of this significant interaction was conducted using the procedure outlined by Holmbeck (2002). This procedure allowed for isolation of the effect of thought suppression on pain catastrophizing at different levels of relationship satisfaction.

In order to complete this analysis two new variables, representing high and low levels of relationship satisfaction ($\pm 1SD$) were created. New interaction terms were then created using these new variables and two separate regressions were then conducted: one testing the effect of thought suppression on pain catastrophizing at high levels of relationship satisfaction and one testing the effect of thought suppression at low levels of relationship satisfaction. These regressions showed a significant effect for thought suppression at high levels of relationship satisfaction ($B = .584, t = 4.162, p < .001$), but the association between thought suppression and pain catastrophizing was not significant at low levels of relationship satisfaction ($B = -.066, t = -.267, p = .791$). This interaction can also be seen in Figure 1.

Hypothesis 4: *There will be a positive association between emotion inhibition and pain outcomes, and the association will be mediated by catastrophizing.*

There was not support for this hypothesis. As can be seen in Table 2, there was not a significant positive association between emotion inhibition variables (AEQ and WBSI) and the pain outcome variables (Cold Pressor time and VAS Δ) and therefore, consistent with the recommendations put forth by Baron and Kenny (1986), a mediation analysis could not be conducted.

Chapter IV

Discussion

Pain is not only common, but is also exorbitantly costly, both in terms of health care expenses but also in regard to the myriad of effects that the individual with pain and his or her social network can experience. Purely physiological models of pain do not seem to account for the psychosocial variables that have been shown to related to pain outcomes. Various psychological and social variables have been linked to pain outcomes, but many studies do not examine how these variables interact to form the experience of pain. The purpose of this study was to examine how emotional inhibition is related to pain outcome variables in the context of the Communal Coping Model of pain catastrophizing. Specifically, this study measured emotion inhibition variables (i.e., thought suppression and ambivalence over emotional expression), relationship satisfaction, and negative affect are related to pain catastrophizing and pain outcomes (i.e., pain rating and pain tolerance) following an acute pain task.

Overall, many of the study hypotheses were not supported, with the exception of one in that the association of thought suppression and catastrophizing was moderated by relationship satisfaction. This discussion will begin with an overview of some general study factors that may have impacted the results (i.e., task effects, relationship satisfaction, ambivalence). Next, the results of each individual hypothesis will be

discussed with a focus on the implications of the study in terms of clinical practice and future research. Finally, there will be discussion of the limitations and strengths of the study.

Many of the unconfirmed hypotheses in this study involved change in negative affect. Given the previously discussed link between negative affect and pain, it was expected that overall participants would experience a change in negative affect; specifically, that negative affect would increase from baseline to post-cold pressor. However, this was not the case as there was not a significant change in negative affect from pre- to post-task. Of note, the pre-task PANAS was administered following the research assistant notifying the participant that he or she was to complete the cold pressor task, potentially increasing negative affect at baseline, which could have impacted the baseline measures. This procedural choice was done so that participants could provide a full informed consent to the study. The researchers deemed that withholding this information and having participants complete the PANAS would have unduly increased the level of deception for the study. Alternatively, the lack of change in negative affect following the cold pressor could be interpreted as an increase in relief following the pain task (Bresin, Gordon, Bender, Gordon, & Joiner, 2010). Another possible explanation for this lack of change could be attributed to the buffering effect in which highly satisfying relationships can mitigate the adverse effects of emotional distress (Rosand, Slinning, Eberhard-Gran, Roysamb, & Tambs, 2011). Perhaps this highly satisfied sample had lower levels of negative affect due to the presence of their partner. Finally, because this study looking at changes in negative affect in the context of experimental pain instead of clinical pain, the pain may not have been seen as threatening to one's health or life and

thus, the negative affect accompanying the pain may have been reduced (Price, Harkins, & Baker, 1987). While there were some significant correlations between the negative affect change scores to the VAS change scores, these associations should be interpreted with a great deal of caution given the overall lack of change in negative affect.

Another set of anticipated results that did not come to fruition were those involving ambivalence. A review of the literature regarding ambivalence and its association with pain indicates higher levels of ambivalence are linked to worsened psychological and physiologically-related pain outcomes including increased pain behaviors, lower energy levels, decreased utilization of social support, and more self-reported pain (Emmons & Colby, 1995; Lu et al., 2011; Porter et al., 2005). However, these studies tend to utilize chronic pain samples, as opposed to a sample exposed to experimental pain as in this study. As in the case of negative affect in this study, the experimental nature of this study may decrease the threat value of the pain and thus, the affective component of the pain is lower than that would be found in a clinical sample, whose pain is more likely to be perceived as threatening and debilitating. Without the accompanying emotional experience that would be found in clinical pain, participants' ambivalent tendencies may not be activated in this context. Therefore, the associations that are found for thought suppression but not for ambivalence can perhaps be explained by the experimental nature of this study.

Finally, the sample in this study displayed an unusually high level of relationship satisfaction. Unlike many studies that measure relationship satisfaction in the context of pain, this study utilized an undergraduate sample and measured relationship satisfaction within these couples with an average age of approximately 21 years and relationship

duration of about two and a half years. Unlike studies utilizing older participants, this sample was largely unmarried and had a relatively high level of relationship satisfaction. Indeed, younger adults tend to display larger levels of relationship satisfaction relative to their middle-aged counterparts, likely due to strains placed on relationship during middle-age such as children (Jose & Alfons, 2007). Overall, DAS scores did not correlate significantly with any of the other psychological or pain outcome variables in contrast to literature that links relationship satisfaction to pain outcomes, catastrophizing, and emotion inhibition; these unexpected results may be explained by the high relationship satisfaction scores and the types of relationships in this sample. Many of these participants were likely in the “honeymoon phase” of their relationship, a beginning phase of a relationship characterized by high levels of intimacy and happiness; as time progresses, more realistic appraisals of one’s relationship and partner often lead to a marked decrease in relationship satisfaction (Schwebel, Moss, & Fine, 1999). If the sample included older participants with longer relationship durations, relationship satisfaction levels may have been at lower, more expected level.

Hypothesis 1

It was expected that independently, change in negative affect, catastrophizing, and emotion inhibition would all have a positive association with worsened pain outcomes (as measured by a shorter time on the cold pressor task and higher VAS change score between time 2 and time 1 distribution).

In this study, pain tolerance was measured by the participants’ cold pressor time, with greater times indicating higher pain tolerances. None of the above measures had significant associations with cold pressor time. It is worth noting surprisingly high

number of participants (n=17, or approximately one-third of participants) reached the cut-off time for the cold pressor task at 180 seconds. This is inconsistent with other research with 5°C cold pressor apparatuses that show a mean task time of approximately 90 seconds (Mitchell, MacDonald, & Brodie, 2004). The relatively high number of participants completing the task suggests that there may be something unusual about this particular sample and a future investigation is warranted. Additionally, cold pressor time did not significantly correlate with pain ratings. While unexpected, this finding is consistent with the idea that the experience of pain is highly subjective and does not always correlate with injury or in this case, time spent in the cold pressor.

Participants' pain ratings were assessed via a change score between their pain rating prior to and immediately after the cold pressor task, with a higher score indicating a higher pain rating as the result of the task. The VAS change score was significantly positively associated with only change in negative affect and pain catastrophizing, indicating that higher pain ratings were associated with increased change in negative affect and increased utilization of catastrophizing. The significant association between negative affect and the VAS change score was an interesting finding in this study. While past research has indicated as greater negative affect tends to be associated with poor pain outcomes and higher pain ratings in both clinical and experimental samples (Leen-Feldner, Zvolensky, Feldner, & Lejuez, 2004), there was not a significant change in negative affect between time 1 and time 2 as previously mentioned. While there is a very small change in negative affect between time 1 and time 2, this small amount was predictive of some variables, including the VAS change score. The significant correlation between pain ratings and catastrophizing was also expected, as greater utilization of

catastrophizing is associated with higher pain ratings in experimental pain tasks (Pavlin et al., 2005; Weissman-Fogel et al., 2008).

It was surprising that the VAS change score did not significantly correlate with either WBSI or AEQ, given the past literature that shows both variables tend to be associated with increased pain ratings (e.g., Cioffi & Holloway, 1993; Lu et al., 2011). In the case of ambivalence, the previously mentioned issue of ambivalence in the context of acute, experimental pain may also explain its lack of association with pain ratings. Due to the short-lived nature of the pain in this study, it may not allow for the development of such a maladaptive method of coping and thus, the expected effect on pain ratings would not occur. Further, it's possible that because many participants were likely in the highly-satisfying "honeymoon" phase of their relationships, couple members may be more likely to utilize more effective communication techniques like emotional expression than those in later phases of their relationship (Reese-Weber, 2015). Additionally, Sullivan et al. (1997) posits that in the case of cold pressor tasks experienced pain increases over time. At first, the participant might use non-sensory cues to judge their pain (such as their own use of thought suppression); however, as the task continues and the sensation of pain increases, the participant is more likely to rely on sensory cues for reporting pain. Because this study measured self-reported pain from the cold pressor task at its completion, the association between thought suppression and pain rating may have been muted.

Hypothesis 2

It was anticipated that there would be a positive association between the emotion inhibition variables and change in negative affect, and that association would be

moderated by relationship satisfaction. There was a marginally significant correlation between change in negative affect and thought suppression. Because thought suppression ultimately creates an ironic increase in target thoughts (Wegner et al., 1987), participants that tried to suppress negative thoughts regarding their pain likely had an increase in these thoughts, ultimately enhancing their negative affect. The correlation between change in negative affect and ambivalence, however, was not significant. While ambivalence has been linked to depressive symptomology (Lu et al., 2011), ambivalence over emotional expression may reflect more of a trait-like response style that would worsen physiological and psychological pain-related outcomes over time as the individual in pain continually avoids seeking social support and expressing emotions effectively.

Relationship satisfaction did not moderate the association between the emotion inhibition variables and change in negative affect. There may be several statistical reasons why this association wasn't significant; first, this may have been due to the very small and non-significant change in negative affect. When this is coupled with the modest effect size of the association between thought suppression and VAS, there may not have ultimately been a big enough effect to detect with such limited power. Finally, the more effective communication styles seen in shorter-duration relationships may have muted the negative effects of emotion inhibition such as increased negative affect. Future research is warranted on how relationship dynamics could affect the association between emotion inhibition and negative affect in a clinical context.

Hypothesis 3

It was expected that there would be a positive association between the emotion inhibition variables and catastrophizing. As expected, there were significant positive associations between thought suppression and catastrophizing, as well as between ambivalence and catastrophizing. This indicates that increased use of emotion inhibition is associated with increased utilization of catastrophizing. These results are consistent with past literature that indicates that higher levels of ambivalence and thought suppression are linked to higher levels of pain catastrophizing; ambivalence may make the individual less willing to express emotions and instead engage in pain expression, and thought suppression may lead to an ironic increase in pain-related thoughts and subsequent increase in pain-related distress (Gilliam et al., 2010; Lu et al., 2011).

In addition, it was predicted that the relationship between the emotion inhibition variables would be moderated by relationship satisfaction. This moderation did occur in the case of the association between thought suppression and catastrophizing. Specifically, thought suppression significantly positively correlated with catastrophizing at high levels of relationship satisfaction, but such an association did not exist at low levels of relationship satisfaction. This finding is consistent with the Communal Coping Model presented by Sullivan et al. (2001). Relationship satisfaction did not moderate the association between ambivalence and catastrophizing. This result is unexpected given that past research has linked ambivalence to higher levels of catastrophizing and lower levels of perceived social support and relationship satisfaction (Emmons & Colby, 1995; King, 1993; Lu et al., 2011). However, this lack of a moderation effect may reflect the previously discussed issues of ambivalence in the context of experimental pain.

The partial confirmation of Hypothesis 3 in that the association between thought suppression and catastrophizing is moderated by relationship satisfaction and in particular, the association exists only when relationship satisfaction is high, is particularly interesting in that it fits well within the Communal Coping Model of Catastrophizing as presented by Sullivan et al. (2001). In the context of pain, an individual may engage in thought suppression in hopes of reducing distress associated with pain-related thoughts. However, because suppression actually leads to a monitoring process that sensitizes the mind to that thought, the pain-related thought becomes more readily available and the individual can ultimately become more distressed (Gross & Levenson, 1993; Wegner et al., 1987), which in turn lead them to use catastrophize. In the context of supportive, happy relationships it may be that this catastrophizing is then associated with support provision.

While research has yet to clarify the exact temporal association between thought suppression and catastrophizing, Cioffi and Holloway (1993) argue engagement in thought suppression and a subsequent failure to reduce pain-related distress may serve as a signal that one's current coping strategy is failing, increasing the threat value of the pain signals. Within an interpersonal context such as in this study, the individual in pain may engage in catastrophizing as a coping strategy in order to elicit empathic support from their partner and through this, help alleviate distress associated with their pain. Indeed, in cases of short-lived pain, catastrophizing's communicative function may serve directly to signal a need for emotional and pain-related support (Cano, 2004). Indeed, high catastrophizing individuals experiencing pain in the presence of their partner report greater levels of self-perceived spousal support after completing an experimental pain

task (Burns et al., 2015). However, the interpersonal function of catastrophizing is contingent on the idea that this form of interpersonal coping will in fact be effective in helping reduce pain-related distress.

In this study, the thought suppression positively predicted catastrophizing, but only with higher levels of relationship satisfaction. Higher levels of relationship satisfaction are associated with greater perceptions of social support and validation from one's partner (Issner, Cano, Leonard, & Williams, 2012). On the other hand, lower levels of relationship satisfaction are linked to more punitive responses and less support from their partner (Pence, Cano, Thorn, & Ward, 2006). When a partner is dissatisfied in their relationship, providing support to a partner in need may seem burdensome and can increase feelings of anger and resentment toward their partner (Issner et al., 2012). Knowing their partner is unlikely to provide the support they seek, individuals in pain engaging in maladaptive coping strategies such as thought suppression may not utilize an interpersonal coping strategy such as catastrophizing to help lessen their pain-related distress. Thus as in this study, the use thought suppression is not predictive of catastrophizing when relationship satisfaction low.

Hypothesis 4

It was anticipated that there would be a positive association between the emotion inhibition variables and pain outcomes. This association did not exist for either emotion inhibition variable nor either pain outcome variable. As previously discussed, the acute, experimental nature and timing of pain ratings in this study may have not captured the effect of the emotion inhibition variables on pain outcomes. Further, because the above associations did not exist, the analysis for the anticipated mediation by catastrophizing

did not occur. It was anticipated that like the findings of Lu et al. (2011) that showed catastrophizing fully mediated the association between ambivalence and pain outcomes, catastrophizing would also mediate the association between thought suppression and pain. However, because an initial correlation between the pain outcomes and emotion inhibition variables was not present, the mediation analysis could not occur.

Strengths and Limitations of the Current Study

Limitations. There were several limitations of the current study. First, as previously noted, the sample consisted of undergraduate students at the University of Michigan- Dearborn. Based on exclusionary criteria, none of the participants had a history or were currently experiencing chronic pain. Pain resulting from a cold pressor task has been established as an useful model for clinical pain based on its unpleasantness and ability to be controlled, as well as its high reliability and validity (Mitchell et al., 2004); however, experimental pain is surely not a perfect model for clinical pain as it may not evoke some of the same affective components. As a result, some of the measured psychological variables like change in negative affect and ambivalence may have been affected.

Secondly, the use of this younger and generally unmarried sample may not reflect the relationship qualities of the general population, nor the chronic pain population. Many studies investigating relationship satisfaction in the context of pain utilize married, middle-aged individuals; while this sample is likely more representative of the chronic pain population, these individuals are less easily accessible than the undergraduate sample utilized in this study. As previously discussed, relationship qualities seen in this study's sample likely differ from that of the chronic pain population and thus, the

findings regarding relationship satisfaction in this study may not be as generalizable to an older population.

Finally, the sample size for this study was not as large as the researchers had anticipated due to limited time. With a smaller sample size, many of the analyses may not have had adequate power to detect many of the tested associations. Perhaps as recruitment for the larger study continues, some of these associations may be able to be detected with a larger sample.

Strengths. One particular strength of this study is that, to the author's knowledge, it is first study to examine the effect of emotion inhibition in the context of relationship satisfaction and the communal coping model of catastrophizing. While some studies have examined these variables independently in relation to catastrophizing, this study integrates these variables together to suggest how relationship satisfaction may affect when individuals who are unsuccessfully coping with pain may utilize catastrophizing within an interpersonal interaction. The finding that thought suppression was predictive of catastrophizing only for individuals who are more highly satisfied in their relationship confirms the communal coping model in that their partners can likely be counted on to provide an empathic response in reaction to catastrophizing. This suggests that catastrophizing may be a successful coping technique for individuals who are highly satisfied in their relationship, but perhaps not so for less-satisfied individuals.

Another strength of this study is the screening process utilized for participants. One advantage of an experimental pain task like the cold pressor is that pain can be assessed without the clouding of confounding variables. In this study, participants were excluded from participation if they had a history of cardiovascular disorders, chronic

pain, frostbite, or seizures, and were asked not to use substances that may affect their pain perception such as caffeine, alcohol, or analgesics. Having such exclusionary criteria helped assure the pain experienced during the cold pressor task was not affected by other factors.

Future Research and Implications

Future research on the association between thought suppression, catastrophizing, and relationship satisfaction are found in a clinical sample of pain patients, as well as a non-college sample to determine if these results are indeed generalizable to both a general and clinical population. As part of a larger study, this study did not analyze collected data pertaining to attachment measures or stress appraisals; these variables could provide valuable insight into the participants' perceptions regarding the threat value of the task and how different attachment styles may expand our understanding of the communal coping model.

Overall, the results from this study suggest that pain-related distress may not be as easily managed within an interpersonal context for individuals with low relationship satisfaction. These individuals are unlikely to receive empathic, supportive responses and instead may be subject to punitive, anger-driven responses from their partners which can increase the experience of pain and depression. Thus, dissatisfied individuals that engage in catastrophizing in the presence of their partner may be subject to poor physiological and psychological pain outcomes, such as increased depression, disability, and pain (McCracken, 2005). On the other hand, individuals in satisfying relationships may benefit from utilizing catastrophizing in the presence of their partner. If an individual is utilizing a maladaptive strategy such as thought suppression to cope with his or her pain,

catastrophizing may serve as a useful tool to elicit support from a partner. It is important to note these implications likely only apply to pain that is short-lived. While catastrophizing in an interpersonal context can be beneficial in the short-term, continued utilization of this strategy is linked to the development of negative responses from one's partner, interpersonal conflict, and depression (Cano, 2004; Sullivan, 2012). In addition, spouses' continued solicitous responding may reinforce pain behaviors over time and promote disability (Sullivan et al., 2001). Thus for chronic pain, alternative methods of coping should be sought in order to avoid such negative consequences.

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Tables

Table 1.

Descriptive Statistics of the Sample Data

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Age	42	21.170	4.248
Relationship Duration (months)	50	30.750	28.227
VAS Δ	50	50.900	24.660
Cold Pressor Time	50	98.240	68.501
PANAS – Negative Affect Δ	48	-.4792	3.914
WBSI	50	51.767	9.467
AEQ	50	2.509	.703
PCS	49	22.598	12.588
DAS	50	119.531	14.052

Note. VAS Δ = change in Visual Analog Scale score between time 2 and time 1, PANAS Δ = change in Positive and Negative Affect Schedule score between time 2 and time 1, WBSI= White Bear Suppression Inventory, AEQ= Ambivalence over Emotional Expressiveness Questionnaire, PCS= Pain Catastrophizing Scale, DAS= Dyadic Adjustment Scale.

Table 2.

Correlations between Pain Outcomes, change in Negative Affect, Pain Catastrophizing, Emotion Inhibition, and Relationship Satisfaction

	CPT	VAS Δ	PANAS – NA Δ	PCS	WBSI	AEQ	DAS
CPT	--	.001	-.096	-.074	.073	.134	-.162
VAS Δ	--	--	.356*	.531**	.133	.159	.126
PANAS – NA Δ	--	--	--	.182	.262 ⁺	.006	.117
PCS	--	--	--	--	.422**	.356*	-.088
WBSI	--	--	--	--	--	.514**	.125
AEQ	--	--	--	--	--	--	-.103
DAS	--	--	--	--	--	--	--

Note. CPT = Cold Pressor Time, VAS Δ= change in Visual Analog Scale score between time 2 and time 1 PANAS= Positive and Negative Affect Schedule, NA Δ= change in Negative Affect, PCS= Pain Catastrophizing Scale, WBSI= White Bear Suppression Inventory, AEQ= Ambivalence over Emotional Expressiveness Questionnaire, DAS= Dyadic Adjustment Scale. **= $p < .01$, * = $p < .05$, + = $p < .10$.

Table 3.

Hierarchical Linear Regressions of Emotion Inhibition and Relationship Satisfaction in predicting Change in Negative Affect

Emotion Inhibition Variable	Step	Predictor	<i>R</i>	<i>R</i> ²	ΔR^2	<i>B</i>	β	<i>t</i>	
WBSI	1		.274	.075	--	--	--	--	
		WBSI	--	--	--	.102	.250	1.728 ⁺	
		DAS	--	--	--	.023	.082	.569	
	2			.282	.080	.005			
		WBSI	--	--	--	-.177	-.434	-.297	
		DAS	--	--	--	-.082	-.300	-.363	
	WBSI x DAS	--	--	--	.002	.832	.471		
AEQ	1		.119	.014	--	--	--	--	
		AEQ	--	--	--	.099	.018	.122	
		DAS	--	--	--	.033	.119	.800	
	2			.119	.016	.002			
		AEQ	--	--	--	-1.926	-.353	-.270	
		DAS	--	--	--	-.008	-.028	-.052	
	AEQ x DAS	--	--	--	.016	.388	.286		

Note. WBSI= White Bear Suppression Inventory, AEQ= Ambivalence over Emotional Expressiveness Questionnaire, DAS= Dyadic Adjustment Scale. **= $p < .01$, * = $p < .05$, + = $p < .10$.

Table 4.

Hierarchical Linear Regressions of Emotion Inhibition and Relationship Satisfaction in predicting Pain Catastrophizing

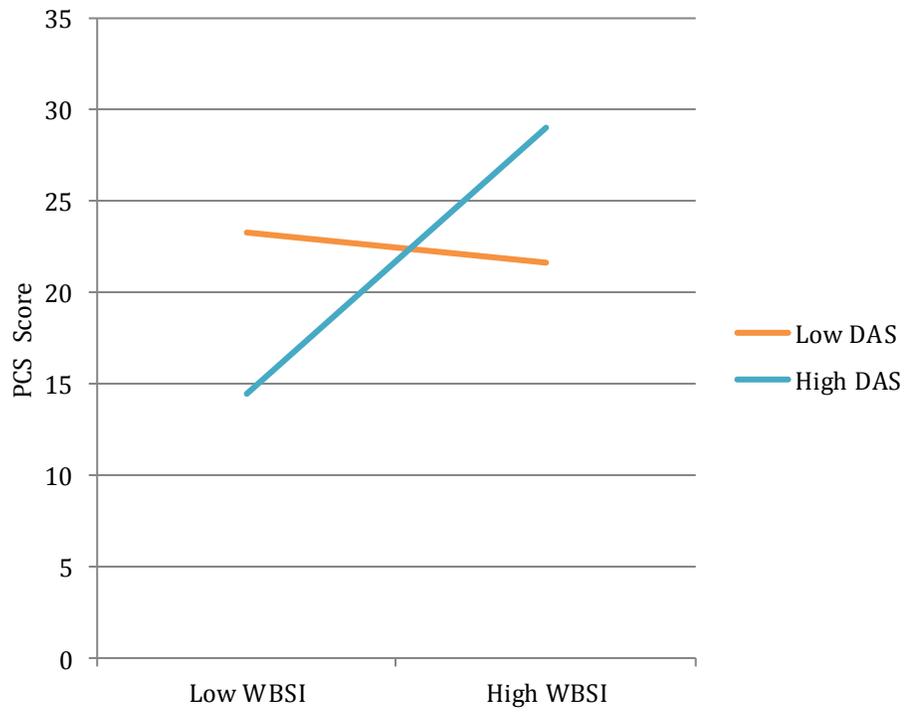
Emotion Inhibition Variable	Step	Predictor	<i>R</i>	<i>R</i> ²	ΔR^2	<i>B</i>	β	<i>t</i>	
WBSI	1		.446	.198	--	--	--	--	
		WBSI	--	--	--	.580	.440	3.309**	
			DAS	--	--	--	-.127	-1.072	
	2			.537	.288	.090*			
			WBSI	--	--	--	-3.300	-2.507	-2.018*
			DAS	--	--	--	-1.603	-1.807	-2.547*
	WBSI x DAS	--	--	--	.030	3.575	2.384*		
AEQ	1		.360	.129	--	--	--	--	
		AEQ	--	--	--	6.126	.351	2.535*	
		DAS	--	--	--	-.046	-.051	-.372	
	2			.378	.143	.014			
			AEQ	--	--	--	-11.730	-.662	-.549
			DAS	--	--	--	-.404	-.456	-.915
	AEQ x DAS	--	--	--	.141	1.057	.845		

Note. WBSI= White Bear Suppression Inventory, AEQ= Ambivalence over Emotional Expressiveness Questionnaire, DAS= Dyadic Adjustment Scale. **= $p < .01$, * = $p < .05$, + = $p < .10$.

Figures

Figure 1.

Interaction between WBSI and DAS predicting PCS



Appendix B: Demographics Questionnaire

Please fill out the following information:

Date of Birth: ___/___/_____

Status in School: Freshman Sophomore Junior Senior Other

Sex: Male Female

Weight: _____lbs. Height: _____ft _____in

Marital Status (please check the appropriate box):

- Married
- Dating
- Engaged

Start of Relationship Date: ___/___/_____

Ethnicity:

- Hispanic
- Arabic
- Other (specify):_____

Race:

- White/Caucasian
- Black/African American
- Asian
- Mixed/Other

What is your religious affiliation?

- Muslim
- Protestant Christian
- Roman Catholic
- Jewish
- Hindu
- Other (Specify):_____

Appendix C: PANAS (1&2)

Participant ID: _____

PANAS

The words below describe different feelings and emotions. Read each item and then, in the space next to that word, indicate the extent to how you currently feel.

1	2	3	4	5
Very slightly	a little	moderately	quite a bit	extremely
or not at all				

_____ interested	_____ irritable
_____ distressed	_____ alert
_____ excited	_____ ashamed
_____ upset	_____ inspired
_____ strong	_____ nervous
_____ guilty	_____ determined
_____ scared	_____ attentive
_____ hostile	_____ jittery
_____ enthusiastic	_____ active
_____ proud	_____ afraid

Appendix D: VAS

Visual Analog Scale



Appendix E: WBSI

Participant # _____

WBSI

This survey is about thoughts. There are no right or wrong answers, so please respond honestly to each of the items below. Be sure to answer every item by circling the appropriate response below each question. Please only circle one response per question.

1. There are things I prefer not to think about.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

2. Sometimes I wonder why I have the thoughts I do.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

3. I have thoughts that I cannot stop.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

4. There are images that come to mind that I cannot erase.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

5. My thoughts frequently return to one idea.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

6. I wish I could stop thinking of certain things.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

7. Sometimes my mind races so fast I wish I could stop it.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

8. I always try to put problems out of mind.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

9. There are thoughts that keep jumping into my head.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

10. There are things that I try not to think about.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

11. Sometimes I really wish I could stop thinking.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

12. I often do things to distract myself from my thoughts.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

13. I have thoughts that I try to avoid.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

14. There are many thoughts that I have that I don't tell anyone.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

15. Sometimes I stay busy just to keep thoughts from intruding on my mind.

Strongly Disagree Disagree Neutral or Don't Know Agree Strongly Agree

Appendix F: AEQ

AEQ

Please answer each item with the view to its overall meaning. Thus if a statement consisted of two thoughts, subjects were encouraged to give the item a high rating only if both thoughts applied to them.

Please circle the best answer to each question based on the following:

- 1 = **Never** Feel This Way
- 2 = **Occasionally** Feel This Way
- 3 = **Sometimes** Feel This Way
- 4 = **Often** Feel This Way
- 5 = **Frequently** Feel This Way

		Never	Occasionally	Sometimes	Often	Frequently
1. I want to express my emotions honestly but I am afraid that it may cause me embarrassment or hurt. <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	
2. I try to control my jealousy concerning my boyfriend/girlfriend even though I want to let them know I'm hurting <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	
3. I make an effort to control my temper at all times even though I'd like to act on these feelings at times. <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	
4. I try to avoid sulking even when I feel like it. <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	
5. When I am really proud of something I accomplish I want to tell someone, but I fear I will be thought of as conceited. <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	
6. I would like to express my affection more physically but I am afraid others will get the wrong impression. <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	
7. I try not to worry others even though sometimes they should know the truth. <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	
8. Often I'd like to show others how I feel, but something seems to be holding me back. <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	
9. I strive to keep a smile on my face in order to convince others I am happier than I really am. <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	
10. I try to keep my deepest fears and feelings hidden, but at times I'd like to open up to others. <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	
11. I'd like to talk about my problems with others, but at times I just can't. <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	
12. When someone bothers me, I try to appear indifferent even though I'd like to tell them how I feel. <input type="checkbox"/>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	

	Never	Occasionally	Sometimes	Often	Frequently
13. I try to refrain from getting angry at my parents even though I want to at times.	1	2	3	4	5
14. I try to show people I love them, although at times I am afraid that it may make me appear weak or too sensitive.	1	2	3	4	5
15. I try to apologize when I have done something wrong but I worry that I will be perceived as incompetent.	1	2	3	4	5
16. I think about acting when I am angry but I try not to.	1	2	3	4	5
17. Often I find that I am not able to tell others how much they really mean to me.	1	2	3	4	5
18. I want to tell someone when I love them, but it is difficult to find the right words.	1	2	3	4	5
19. I would like to express my disappointment when things don't go as well as planned, but I don't want to appear vulnerable.	1	2	3	4	5
20. I can recall a time when I wish that I had told someone how much I really cared about them.	1	2	3	4	5
21. I try to hide my negative feelings around others, even though I am not being fair to those close to me.	1	2	3	4	5
22. I would like to be more spontaneous in my emotional reactions but I just can't seem to do it.	1	2	3	4	5
23. I try to suppress my anger, but I would like other people to know how I feel.	1	2	3	4	5
24. It is hard to find the right words to indicate to others what I am really feeling.	1	2	3	4	5
25. I worry that if I express negative emotions such as fear and anger, other people will not approve of me.	1	2	3	4	5
26. I feel guilty after I have expressed anger to someone.	1	2	3	4	5
27. I often cannot bring myself to express what I am really feeling.	1	2	3	4	5
28. After I express anger at someone, it bothers me for a long time.	1	2	3	4	5

Appendix H: DAS

DAS

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

	Always Agree	Almost Always Agree	Occasionally Disagree	Frequently Disagree	Almost Always Disagree	Always Disagree
Handling Family Finances	0	1	2	3	4	5
Matters of Recreation	0	1	2	3	4	5
Religious Matters	0	1	2	3	4	5
Demonstrations of Affection	0	1	2	3	4	5
Friends	0	1	2	3	4	5
Sex Relations	0	1	2	3	4	5
Conventionality (correct or proper behavior)	0	1	2	3	4	5
Philosophy of Life	0	1	2	3	4	5
Ways of Dealing with Parents or In-Laws	0	1	2	3	4	5
Aims, Goals, and Things Believed Important	0	1	2	3	4	5
Amount of Time Spent Together	0	1	2	3	4	5
Making Major Decisions	0	1	2	3	4	5

Household Tasks 5	0	1	2	3	4
Leisure Time Interests and 5 Activities	0	1	2	3	4
Career Decisions 5	0	1	2	3	4

Never	All The Time	Most of The Time	More Often Than Not	Occasionally	Rarely
-------	-----------------	---------------------	---------------------------	--------------	--------

How often do you discuss or have you considered divorce, separation, or 5 terminating your relationship?	0	1	2	3	4
--	---	---	---	---	---

How often do you or your mate leave the house after 5 a fight?	0	1	2	3	4
--	---	---	---	---	---

In general, how often do you think that things between 5 you and your partner are going well?	0	1	2	3	4
--	---	---	---	---	---

Do you confide in 5 your mate?	0	1	2	3	4
--------------------------------------	---	---	---	---	---

Do you ever regret 5 that you married	0	1	2	3	4
---	---	---	---	---	---

Do you kiss your mate?	Every Day □	Almost Every Day □	Occasionally □	Rarely □	Never □
Do you and your mate engage in outside activities together?	All of Them □	Most of Them □	Some of Them □	Very Few of Them □	None of Them □

How often would you say the following events occur between you and your partner?

	Never	Less than Once per Month	Once or Twice a Month	Once or Twice a Week	Once a Day	Often
Have a stimulating exchange of ideas	0	1	2	3	4	5
Laugh Often	0	1	2	3	4	5
Calmly discuss something	0	1	2	3	4	5
Work together on a project	0	1	2	3	4	5

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

Being too tired for sex Yes ___ No___

Not showing love Yes___ No___

Which of the following statements best describes how you feel about the future of your relationship?

(Choose One)

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

The numbers on the following line represent different degrees of happiness in your relationship. The middle point (happy), represents the degree of happiness in most relationships. Choose the bubble which best describes the degree of happiness, all things considered, of your relationship.

Extremely Fairly A Little Very Extremely Perfectly

Appendix I: Eligibility Script

“You are here to participate in the ICE PAC Study. In this study we are looking to better understand how couples’ dynamics and emotions can influence response to a stressful situation. Before we begin, I want to make sure that you are eligible to participate today.

As you might remember from the SONA description of the study in order to be eligible you need to be 18 years of age or older, in a heterosexual relationship of at least 6 months, able to read, write, and understand English, and have eaten something in the last two hours. In addition, you will be excluded from the study if you have consumed caffeine in the last two hours, have a history of chronic pain (duration of at least three months), have taken any analgesic medications within 24 hours of the study (i.e., prescription, cold-medications, OTC medications), have consumed alcohol in the last 12 hours, have any history of cardiovascular disorders or diseases, have a history of fainting or seizures, have a history of frostbite on their hands, have an open cut or sore on your non-dominant hand, or are currently pregnant.

Based on this information are you eligible to participate in the study today?”

If participant answers yes, the participants will be given the appropriate consent form.

If participant answers no, the participants will be asked to reschedule their participation time, or will be given ½ credit on SONA and dismissed from the study.

Appendix J: Subject Pool Consent Form

EXPERIMENTAL SUBJECT POOL PARTICIPATION CONSENT FORM ICEPAC Study

The psychology faculty considers participation in experimental research by subjects to be an educational experience for the students as well as a most important service to the research of the University. This research project has been approved by the University of Michigan-Dearborn Institutional Review Board (IRB Dearborn). Participation is voluntary, if you choose **not** to participate as a research subject you may participate in another research related activity at no expense to your academic record or standing. The purpose of today's experiment is to better understand how couples' dynamics and emotions can influence response to a stressful situation.

Psychology Subject Pool Subjects

As a part of your participation in an Introductory Psychology course at the University of Michigan – Dearborn, you agree to serve as a research subject for this experiment. You have read and understood the “Subject Pool Participation” description information that you viewed when you registered on the SONA System website as a research participant. You understand that completing the study will take approximately 90 minutes and for your participation, you will be given 1.5 research credits in SONA. You may choose **not** to serve as a research subject and may instead participate in another research-related activity at no expense to your academic record or standing. You may withdraw at any time from today's study without penalty or loss of research participation credit.

Upper Level Psychology Course Research Subjects

As a part of your participation in an upper level psychology course at the University of Michigan – Dearborn, you agree to serve as a research subject for this experiment. You have read and understood the “Subject Pool Participation” description information that you viewed when you registered on the SONA System website as a research participant. You understand that completing the study will take approximately 90 minutes and for your participation, you will be given 1.5 research credits in SONA. You may choose **not** to serve as a research subject and may instead participate in another research-related activity at no expense to your academic record or standing. You may withdraw at any time from today's study without penalty or loss of research participation credit.

Description of Subject Involvement

The procedure in today's study involves study questionnaires will ask about your level of satisfaction within your current relationship and about how you view your partner's behavior in the relationship. You will also be asked about your views about being in

relationships with others and about the experiences of the research tasks. Participation involves completing a cold-pressor task, where you will be asked to place your hand in a basin of water that is kept at a 40 degrees Fahrenheit while being in the room with a partner.

The study will also require that your relationship partner and you discuss your experience in the study and this discussion will be videorecorded. This recording is for the purposes of research only and will not be displayed publicly or in the context of a course offered at the University of Michigan – Dearborn. To protect your safety, refrain from discussing illegal behavior, intent for physical violence or self-harm, and sensitive health information. Your name and identity will not go beyond the original experimenter's records and will be confidential unless you specifically authorize it to be used in any other way. Your video recording will be kept on an encrypted hard drive, in a locked file cabinet, in a locked laboratory until the study's conclusion.

The risks include psychological distress (e.g., transient symptoms of anxiety such as worry or feeling apprehensive). In addition, you may experience discomfort when you place your hand in the cold water. The researchers have taken steps to minimize the risks of this study. Even so, you may still experience some risks related to the participation, even when the researchers are careful to avoid them. These risks include: increased heart rate, perspiration, and in rare incidents fainting. You should tell the researchers if you feel you have been harmed as a result of participation in this study. By signing this form, you understand that you do not give up the right to seek payment if harmed as a result of being in this study. The study staff will try to reduce the likelihood of these risks and will provide you with resources for follow-up care if necessary.

The benefits to participating in the study include: gaining insight about yourself and your relationship, your ability to understand your partner, and bio-behavioral research methods. After you have completed the study protocol, no further action is needed on your part. Other your name or course number/instructor, no identifying information will be obtained from you, and that the study staff will keep your responses anonymous and confidential.

The researchers plan to publish or present the results of this study, but will not include any information that would identify you. There are some reasons why people other than the researchers may need to see information you provided as part of the study. This includes organizations responsible for making sure the research is done safely and properly, including the University of Michigan, government offices.

Contact Information

If you have questions about the study you may contact Dr. Michelle Leonard (mtleon@umd.umich.edu) or Dr. David Chatkoff (chatkoff@umd.umich.edu).

If you have questions regarding your rights as a research participant, or wish to obtain information, ask questions, or discuss concerns with someone other than the researcher(s), You may contact the Dearborn IRB Administrator in the Office of Research and Sponsored Programs, 2066 IAVS, University of Michigan-Dearborn,

Evergreen Rd., Dearborn, MI 48128-2406, (313) 593-5468; the Dearborn IRB Application Specialist at (734) 763-5084, or email Dearborn-IRB@umich.edu.

Your participation will require no more than 90 minutes. The purpose and procedure as well as the benefits and risks of the study have been explained to you and the results will be made available to you upon your request. By signing this document, you are agreeing to be in the study. You will be given a copy of this document for your records and one copy will be kept with the study records. Be sure that questions you have about the study have been answered and that you understand what you are being asked to do. You may contact the researcher if you think of a question later.

I agree to participate in this study.

Signature _____
Name: _____
Address: _____
Enrolled in: Psychology _____
Psychology Instructor _____

To be filled by experimenter: Experiment: _____ Date: _____ Experimenter: _____

Appendix K: Non-Subject Pool Consent Form

GENERAL PARTICIPATION CONSENT FORM ICEPAC Study

The psychology faculty considers participation in experimental research by subjects to be an educational experience for the students as well as a most important service to the research of the University. This research project has been approved by the University of Michigan-Dearborn Institutional Review Board (IRB Dearborn). Participation is voluntary, if you choose **not** to participate as a research subject you may participate in another research related activity at no expense to your academic record or standing. The purpose of today's experiment is to better understand how couples' dynamics and emotions can influence response to a stressful situation.

Description of Subject Involvement

The procedure in today's study involves study questionnaires will ask about your level of satisfaction within your current relationship and about how you view your partner's behavior in the relationship. You will also be asked about your views about being in relationships with others and about the experiences of the research tasks. Participation involves completing a cold-pressor task, where you will be asked to place your hand in a basin of water that is kept at a 40 degrees Fahrenheit while being in the room with a partner.

The study will also require that your relationship partner and you discuss your experience in the study and this discussion will be videorecorded. This recording is for the purposes of research only and will not be displayed publicly or in the context of a course offered at the University of Michigan – Dearborn. To protect your safety, refrain from discussing illegal behavior, intent for physical violence or self-harm, and sensitive health information. Your name and identity will not go beyond the original experimenter's records and will be confidential unless you specifically authorize it to be used in any other way. Your video recording will be kept on an encrypted hard drive, in a locked file cabinet, in a locked laboratory until the study's conclusion.

The risks include psychological distress (e.g., transient symptoms of anxiety such as worry or feeling apprehensive). In addition, you may experience discomfort when you place your hand in the cold water. The researchers have taken steps to minimize the risks of this study. Even so, you may still experience some risks related to the participation, even when the researchers are careful to avoid them. These risks include: increased heart rate, perspiration, and in rare incidents fainting. You should tell the researchers if you feel you have been harmed as a result of participation in this study. By signing this form,

you understand that you do not give up the right to seek payment if harmed as a result of being in this study. The study staff will try to reduce the likelihood of these risks and will provide you with resources for follow-up care if necessary.

The benefits to participating in the study include: gaining insight about yourself and your relationship, your ability to understand your partner, and bio-behavioral research methods. After you have completed the study protocol, no further action is needed on your part. Other your name or course number/instructor, no identifying information will be obtained from you, and that the study staff will keep your responses anonymous and confidential.

The researchers plan to publish or present the results of this study, but will not include any information that would identify you. There are some reasons why people other than the researchers may need to see information you provided as part of the study. This includes organizations responsible for making sure the research is done safely and properly, including the University of Michigan, government offices.

Contact Information

If you have questions about the study you may contact Dr. Michelle Leonard (mtleon@umd.umich.edu) or Dr. David Chatkoff (chatkoff@umd.umich.edu). If you have questions regarding your rights as a research participant, or wish to obtain information, ask questions, or discuss concerns with someone other than the researcher(s), You may contact the Dearborn IRB Administrator in the Office of Research and Sponsored Programs, 2066 IAVS, University of Michigan-Dearborn, Evergreen Rd., Dearborn, MI 48128-2406, (313) 593-5468; the Dearborn IRB Application Specialist at (734) 763-5084, or email Dearborn-IRB@umich.edu.

Your participation will require no more than 90 minutes. The purpose and procedure as well as the benefits and risks of the study have been explained to you and the results will be made available to you upon your request. By signing this document, you are agreeing to be in the study. You will be given a copy of this document for your records and one copy will be kept with the study records. Be sure that questions you have about the study have been answered and that you understand what you are being asked to do. You may contact the researcher if you think of a question later.

I agree to participate in this study.

Signature _____
Name: _____
Address: _____
Enrolled in: Psychology _____
Psychology Instructor _____

To be filled by experimenter: Experiment: _____ Date: _____ Experimenter: _____

Appendix L: Study Protocol for Research Assistants

ICEPAC Study Protocol

Upon Arrival

1. Make sure both couple members are present
 - a. If both members are not present, let them know that they will not be penalized in the SONA system
 - i. Ask them to reschedule at a time when each member can attend
 - b. If this is the second appointment and either member of the couple isn't present, give the couple a "no show" on SONA
 - i. Add couple to "blacklist"
2. Phase one of eligibility screening
 - a. **"Hi my name is _____ and I'm the research assistant that will be running the study today. You are here to participate in the ICE PAC Study. In this study we are looking to better understand how couples' dynamics and emotions can influence response to a stressful situation. Before we begin, I want to make sure that you are eligible to participate today.**

As you might remember from the SONA description of the study in order to be eligible you need to be 18 years of age or older, in a heterosexual relationship of at least 6 months, able to read, write, and understand English, and have eaten something in the last two hours. In addition, you will be excluded from the study if you have consumed caffeine in the last two hours, have a history of chronic pain (duration of at least three months), have taken any analgesic medications within 24 hours of the study (i.e., prescription, cold-medications, OTC medications), have consumed alcohol in the last 12 hours, have any history of cardiovascular disorders or diseases, have a history of fainting or seizures, have a history of frostbite on their hands, have an open cut or sore on your non-dominant hand, or are currently pregnant.

Based on this information are you eligible to participate in the study today?"

- b. Document answer on prescreen consent form
3. Give each couple member consent form

"The form I'm about to give you is the consent form. It lays out all the risks and benefits associated with the study and I'm going to have you read it over. Do you have any questions"?

 - a. Give SONA credit-receiving member "SONA Consent" for

- b. Give non credit-receiving member “General Consent” form

Study protocol: pre cold-pressor

1. Give each participant their own
 - a. Eligibility form
 - b. Demographics form
2. Consult random assignment list to see which couple member will be doing cold-pressor task
 - a. Mark down date on random assignment list
 - b. If cold-pressor partner is ineligible to participate, ask them to reschedule or take ½ credit on SONA
3. Introduce study
 - a. **“For the next part of the study we will be using something called the cold pressor task. Throughout this task and several others that are part of the study, you and your partner will be videorecorded, but please know that your confidentiality is very important and these videos will not be shared beyond this research study.**

It looks like (male/female partner name) has been randomly assigned as the couples’ cold pressor participant. Before I tell you about the task I need you to complete two measures and your partner has one to complete. “

4. Give each couple member their own
 - a. PANAS
5. Give cold-pressor participant
 - a. VAS
“For all of the questionnaires that you complete today, I ask that you complete these measures independently and not talk to one another during the time that you are completing them. The first will give a list of words and I need you to rate how well these words describe you at the present moment. Next I need (male/female partner name) to complete this pain rating scale. You will just place an X on this line where your current pain is using the anchors no pain and worst possible pain. I will ask you to use this scale several times today so I want to make sure that I was clear with the instructions. Did that make sense?”

Study Protocol: cold-pressor task

1. Start camera recording
2. Introduce cold-pressor task
 - a. **“Now we will move on to the cold pressor task. I will ask that you place your non-dominant hand in the water, and we ask that you try to keep your hand in for as long as you can. You can move your hand around in the water, but do not splash or rapidly “dip” your hand in and out.**

Most people can keep their hand in for the entire time, but you may remove it at any time. When you take your hand out of the water I need you to just place it in the towel in your lap. Please don't wrap it in the towel or rub it with your hand or the towel. Again, you can remove it whenever you want, but most people can complete the whole time. Do you have any questions?"

3. Ask CP participant to take off any jewelry on hand going in water and place in tub
4. Have participant place hand in water
 - a. Begin stopwatch
 - b. Do not stop couple from talking, but don't engage with them
5. Stop stopwatch once participants' hand is removed
 - a. Document time on Cold-Pressor
6. Give cold-pressor participant
 - a. VAS

Study Protocol: post cold-pressor task

1. **"That was great and it will serve as your practice cold pressor. I am going to have you do one more, but I need to get some paperwork together and I might have to run to make some extra copies. I am going to put the lid on the cooler to preserve the temperature of the water for now.**

In the meantime you and your partner can stay here. Why don't you two talk about what that experience was like....for example what the pain felt like for (male/female partner name) or what it was like to (male/female partner name) to watch the task.... I'll be back in just a few minutes"

2. Leave room for 7 minutes
 - a. Monitor the couple through the two way mirror in the laboratory to ensure safety
 - b. If either couple member touches the other in an aggressive way, profanity is used in an aggressive way, or the couple members voices become raised in aggression toward one another
 - i. Stop participation
 - ii. Debrief participants
3. After 7 minutes is over, come back in to room
4. Give each partner their own
 - a. WBSI
 - b. AEQ
5. Read script to participants
 - a. **"You know what? I think that I have made a mistake and, based on your randomization, you don't actually need to do another cold pressor task. That means that I have also given you the wrong version of the surveys. I'm sorry I'll need you to fill out just a few more surveys before we wrap up today."**
6. Stop recording
7. Give cold-pressor participant
 - a. VAS
8. Give both participants

- a. SAM- Give appropriate versions
 - b. PCS- Give appropriate versions
 - c. PANAS
 - d. DAS
 - e. RAM
 - f. ECR
9. Debriefing
 - a. Give each partner Debriefing form and verbally debrief
 10. Explain how SONA credit will be added
 11. Thank them for their time and excuse them

Appendix M: Debriefing Form

Debriefing Form University of Michigan – Dearborn POST PARTICIPATION INFORMATION

Thank you for your participation in the preceding study. The study team needs to include some important information regarding your decision to be in this study. You were actually engaged in research that used a form of deception. During the study, the research assistant indicated that they had made a mistake in that the couple member participating in the cold pressor task only had to complete it once, and that you were issued the wrong set of surveys. In reality, no mistake was made by the research assistant; the cold pressor task was only intended to be completed one time, and all of the surveys issued were correct and will be used for data analysis. The use of deception in this study was necessary to examine how the couple members would react in anticipation of another cold pressor task. Reactions may have been different if it was known that the pain-eliciting experience would not occur again.

You now have the choice of either having your data included in the research study, or to be withdrawn from the research study. If you choose to withdraw from the research study, your data will be disposed of in your presence.

Given the nature of this study it is necessary that you not talk about your participation with other students or potential participants. As you can surely appreciate, if other participants know the full details of the study prior to participation, this may influence their response to the task and therefore invalidate the data. To ensure the success of the study, it is therefore requested that participants in this study do not tell anyone about the methodology or purpose of the study.

The research assistant will be very willing to discuss any concerns that you have about the study. If you have any continued concerns you are welcome to contact Dr. Leonard or the University of Michigan – Dearborn IRB.

If you feel you need to speak with a professional concerning any uncomfortable feelings from your participation in this research, you may contact any of the agencies listed below.

UM-D Counseling and Support Services (UM-D students only)	313-593-5430
Henry Ford Medical Center- Fairlane for Students, Faculty, and Staff (UM-D Students only)	313-982-8495

Please feel free to contact either of these agencies, and once again thank you for your participation.