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ROLE OF PERCEIVED PARTNER RESPONSIVENESS ON MEXICAN AMERICAN
MALES' PAIN SEVERITY AND DEPRESSIVE SYMPTOMATOLOGY

A Dissertation

Presented to

The Faculty of Social Sciences

University of Denver

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

by

Carolyn M. Freedman

November 2008

Advisors: Howard J. Markman and Michael H. Craine

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ABSTRACT

This study examined the role of cultural indicators in moderating the influence of perceived partner responses and relationship satisfaction on pain severity and depressive symptomatology among a sample of 62 married and cohabiting Mexican American men, the majority of whom were first generation Mexican Americans, with chronic back and/or neck pain. The cultural indicators were not found to act as moderators in the analyses that involved pain severity and depressive symptomatology as outcome variables. Nevertheless, this study's findings are an important initial step in understanding the relationship dynamics among an understudied population with chronic pain and raise many important questions to be pursued in future research. The cultural indicator *simpatia* was found to moderate the association between perceived solicitous partner responses and relationship satisfaction, indicating that for those valuing *simpatia*, solicitous responses may be seen to enhance the relational bond between the couple. Furthermore, perceived punishing partner responses were positively associated with pain severity and depressive symptomatology, indicating that these responses are likely seen as negative and may run against that which Mexican American males are expecting from their female partners, even when they are displayed within the context of a relationship that is generally a source of satisfaction. Findings also indicated that Mexican American men who were more acculturated, had been in the U.S. for a greater number of generations, or were lower in *simpatia*, had worse pain and mood-related outcomes than

those who were on the other side of the continuum of these cultural indicators. Despite its limitations, the present study was the first to examine the role of perceived partner responses on pain severity and depressive symptomatology within a cultural framework. Future studies conducted on larger, more diverse samples of Mexican American participants who fall along the entire acculturation spectrum, with the use of face-to-face interviews and behavioral observations, in addition to better paper and pencil measures than those used in the present study, as well as qualitative studies that focus specifically on first generation Mexican Americans, are needed to further examine the role of cultural indicators on the pain experience of married and cohabiting Mexican Americans.

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Role of Perceived Partner Responsiveness on Mexican American Males' Pain Severity and Depressive Symptomatology

Findings from the chronic pain literature indicate that there is an association between patients' levels of pain-related distress and responses from their spouses (e.g., Flor, Turk, & Scholz, 1987; Kerns et al., 1991). Research on chronic pain patients' perceived spousal responses and on spouses' own responses to patients' pain suggests that these responses can be categorized into three groups: solicitous responses, punishing responses, and distracting responses (Kerns & Rosenberg, 1995; Kerns, Turk, & Rudy, 1985). These responses have been found to interact with marital satisfaction to affect pain severity and depressive symptomatology (Kerns & Turk, 1984). Research also suggests that reaction to and interpretation of pain varies by cultural group (e.g., Garro, 1990; Lipton & Marbach, 1984; Riley, et al., 2002; Sheffield, Biles, Orom, Maixner, & Sheps, 2000; Zborowski, 1969; Zola, 1966), and that Hispanics cope with their pain differently than do non-Hispanic individuals (e.g., Lipton & Marbach, 1980; Weisenberg, Kreindler, Schachat, & Werboff, 1975).

In the United States alone, the annual costs of chronic back and neck pain are tremendous; the estimated health care costs of chronic back pain are approximately \$33 billion each year (Waddell, 1998), while the estimated health care costs of back and neck pain (both acute and chronic) have been found to be approximately \$86 billion each year (Martin, et al., 2008). In addition, the societal costs incurred from chronic back and neck pain include those from lost productivity, lost wages, and disability compensation (Waddell & Turk, 2001). Hispanics are the largest minority group in the United States (U.S. Census Bureau, 2007), with Mexican Americans being the largest ethnically

distinct subgroup (U.S. Census Bureau, 2001). However, the literature in this large segment of the U.S. population regarding back and neck pain is lacking. In fact, two important limitations in the existing literature are that there is a limited number of studies that include ethnically diverse samples and that the studies that do tend to include diverse samples, or samples comprised of participants from a particular ethnic group, fail to explain how cultural indicators associated with different ethnic groups impact the chronic pain experience.

The present study was designed to address these limitations of previous research on the impact of perceived partner responses to chronic pain behaviors on the individual in pain. Specifically, given that the interaction of cultural indicators and partner responses toward pain behaviors has not been studied, this study examined the role of three cultural indicators that may be useful in understanding how the Mexican American experience impacts pain in Mexican American individuals who are involved with an intimate partner: *simpatía*, acculturation, and generational status. *Simpatía* is a characteristic pattern of social interaction among Hispanics that can be defined as the need for pleasant relationships and avoidance of conflict in relationships (Marín & Marín, 1991). Acculturation can be defined as the modifications that occur in a minority group's values, norms, attitudes, and behaviors when they are exposed to a majority culture (Gordon, 1964). Generational status refers to the number of generations that an individual or his family has been a resident of a country, with first generation U.S. residents being individuals who have left their country of origin and settled in the U.S. either during childhood or adulthood, second generation U.S. residents being individuals who were born in the U.S and whose parents left their country of origin and settled in the U.S., etc.

This study examined the role of these three cultural indicators on the pain severity and depressive symptomatology of 62 married or cohabiting Mexican American males.

The Costs of Chronic Back and Neck Pain

Financial costs. Epidemiological studies suggest that between 50% and 70% of adults have back pain at some point in their lives (Anderson, Pope, & Frymoyer, 1984; Waddell, 1998). In addition, it is estimated that 11.7 million Americans are impaired by back pain, with 2.6 million permanently disabled and another 2.6 million temporarily disabled (National Center for Health Statistics, 1981). In the United States alone, the annual costs of chronic back and neck pain are tremendous; the estimated health care costs of chronic back pain are approximately \$33 billion each year (Waddell, 1998), while the estimated health care costs of back and neck pain (both acute and chronic) are approximately \$86 billion each year (Martin, et al., 2008). There are no good estimates of the societal costs of back or neck pain in the United States. However, Waddell and Turk (2001) cite European data that suggests that such societal costs as lost wages, decreased productivity, and disability compensation far outweigh the health care costs and account for 80%-90% of the total costs of back pain.

Research focusing on the pain experience of Mexican Americans could produce information relevant to the treatment of a large segment of the U. S. population. Back and neck pain and their secondary disabilities in Mexican American males have significant societal implications for the United States. As stated above, the greatest proportion of societal costs incurred from chronic back and neck pain are from lost productivity, lost wages, and disability compensation. There are no data on societal costs for Hispanics specifically. However, there is data indicating that certain occupational conditions are

associated with back pain, notably the manual lifting of heavy weights (Walsh, Cruddas, & Coggon, 1990). Many immigrant Hispanics, particularly those who are undocumented, are concentrated in the manufacturing and construction segments of the labor force (Pew Hispanic Center, 2006), jobs that are frequently physically demanding (Catanzarite, 2002). Therefore, Hispanics, and especially immigrant Hispanics, are more likely to suffer acute injuries that could lead to chronic pain, which can result in decreased ability to perform job-related duties due to the pain and physical impairment. Hispanics being the fastest growing minority group in the United States (U.S. Census Bureau, 2007), with Mexican Americans being the largest ethnically distinct subgroup (U.S. Census Bureau, 2001), it appears particularly important for this population to be the focus of studies examining the chronic pain experience. While research has generally grouped people of Hispanic origin together, there are many differences between individuals who are described generically as Latinos or Hispanics. For example, lumping together Mexicans, Puerto Ricans, Cubans, and individuals from Central and South America hides important differences in language, colonial histories, religious traditions, and the fact that these groups have reached different places in American society, which may be characterized by divergent political beliefs and socioeconomic attainment (Dumas, Rollock, Prinz, Hops, & Blechman, 1999). Because the construct of “Hispanics” or “Latinos” may not be very useful, I decided to focus this study on individuals of Mexican origin, given that almost two thirds of Hispanics in the United States are of Mexican descent (U.S. Census Bureau, 2001).

Psychosocial costs. In addition to the financial costs of chronic back and neck pain, individuals with chronic pain incur psychosocial costs. It has been suggested that

77% of chronic back pain patients meet a lifetime diagnostic criteria for at least one psychiatric disorder, while 59% have current symptoms for at least one psychiatric diagnosis, and 51% meet criteria for a personality disorder (Polatin, Kinney, Gatchel, Lillo, & Mayer, 1993). Much research within the back and neck pain literature has been conducted on the psychiatric diagnosis of depression, because of the high degree of comorbidity between depression and chronic pain (Lindsey & Wycoff, 1981; Magni, Caldieron, Rigatti-Luchini, & Merskey, 1990; Romano, & Turner, 1985). Specifically, rates of clinical depression ranging from 30% to 54% have been reported among chronic pain patients (Banks & Kerns, 1996). Further, evidence suggests that the incidence of depression among individuals with chronic pain is higher than for other chronic medical illnesses. Thus, in their review, Banks and Kerns cite data that indicates that rates of clinical depression are of 18% for patients soon after a myocardial infarction, 27% for patients undergoing elective cardiac catheterization for evaluation of suspected coronary artery disease, 23% for women recently diagnosed with gynecological cancer, 27% for patients hospitalized for stroke, and 22% for Parkinson's disease patients.

Three main hypotheses have been presented in various research studies concerning the timing and relationship of depression to that of chronic pain (see the review by Fishbain, Cutler, Rosomoff, & Rosomoff, 1997). The hypothesis that has received the most empirical support is one that posits that depression is a consequence of pain and follows the development of pain. The two other hypotheses that have been examined in the literature have received only partial empirical support. One of these hypotheses is that depression precedes the development of pain, while the other hypothesis is that episodes of depression occurring before the onset of pain predispose

individuals to a depressive episode after the onset of pain. Regardless of the specific mechanism underlying the increased incidence of depression among individuals with chronic pain, it is clear that depression plays an important role in the experience of chronic pain. Indeed, research suggests that chronic pain patients with more depressive symptoms report higher levels of pain, greater disability, greater interference due to pain, display more pain behaviors, are less active, and have more negative thoughts about pain (Haythornthwaite, Seiber, & Kerns, 1991; Geisser, Roth, Theisen, Robinson, & Riley, 2000).

In addition, patients with chronic back pain experience higher levels of stress than non-chronic pain patients, not only from the stress associated with having chronic pain, but also from the stress of searching, often unsuccessfully, for relief from different pain treatments and practitioners (Gatchel & Gardea, 1999). Other psychosocial costs include loss of vocational identity or vocational role for those who can no longer work or have to change jobs to accommodate their pain, and the associated financial impact on the individual and his or her family. Furthermore, individuals who are in pain, and particularly those who are also depressed, may have to incur the psychosocial cost associated with marital dissatisfaction, given that both chronic pain and depression have been found to be independently associated with decreased marital satisfaction (for association with depression, see review by Davila, Karney, Hall, & Bradbury, 2003; for association with chronic pain, see Flor, Turk, et. al., 1987; Mohamed, Weisz, & Waring, 1978).

The Role of the Spouse/Partner in the Pain Experience

Research has demonstrated that significant others, including spouses, partners, or family members, play an important role in maintaining the pain-related behaviors of individuals in pain (e.g., Flor, Turk, & Rudy, 1989; Kerns, Haythornthwaite, Southwick, & Giller, 1990; Kerns & Payne, 1996; Kerns & Weiss, 1994). The majority of these studies have focused on the patient-spousal relationship. However, it should be noted that some of the referred to studies include small numbers of non-spousal significant others in their data. In the present study, I only recruited participants with spouses or cohabiting partners, so as to increase the specificity of the study and keep it focused on intimate relationships, my principal area of interest. However, I will generally use the terms “spouse,” “partner,” and “significant other” interchangeably when referring to the literature.

An important concept in the understanding of the spouse’s role in the pain response is that of operant conditioning. The concept of operant conditioning assumes that behaviors followed by valued events will increase in occurrence. Observable pain behaviors or, in other words, behaviors that communicate information about the individual’s state of pain, distress, and suffering, including complaining, moaning, grimacing, taking medications, or reducing activity, may have served a protective function during the acute pain episode (Fordyce, 1976). However, these pain behaviors may later become maladaptive because they are powerful in eliciting positive social consequences such as attention, sympathy, and assistance from significant others (behaviors referred to as “solicitous responses” in the chronic pain literature). Thus, pain behaviors are potentially maintained by the responses of significant others long after the

acute injury has healed (Fordyce, 1976; Keefe & Lefebvre, 1994). Indeed, significant others, out of a desire to be helpful, may positively reinforce these pain behaviors to the detriment of well behaviors by, for example, failing to encourage productive activity, exercise, or other health-promoting behaviors (Kerns & Payne, 1996). Conversely, patients whose significant others withdraw their attention from pain behaviors and instead attend to and praise activity demonstrate an increase in physical activity and decrease in pain behaviors (Cairns & Pasino, 1977).

In support of the view that significant others have a strong reinforcing power, a number of empirical studies have demonstrated an association between significant others' responses to pain behaviors of chronic pain patients and measures of patients' pain-intensity, pain behaviors, and disability. For example, research involving direct observation of pain patients and their spouses performing a series of simulated household tasks found that spousal solicitous response to pain behavior was associated with a greater frequency of observed pain behavior and reported disability (Romano, et al., 1991). Several additional studies have demonstrated that patients' reports of pain and disability are directly associated with solicitous responses from spouses either as perceived by the patients or as reported by the spouses (Block, Kremer, & Gaylor, 1980; Flor, Turk, et al., 1987; Kerns et al., 1990; Kerns et al., 1991; Paulsen & Altmaier, 1995). Interestingly, Knost, Flor, and Birbaumer (1999) demonstrated that the operant theory of pain might extend to the electro-cortical level. In their study, chronic back pain patients whose spouses showed high levels of solicitousness not only displayed more pain behaviors, but also responded with elevated somatosensory evoked potentials.

It has also been found that distracting responses are associated with increased pain severity, pain behaviors, and disability (Kerns et al., 1990; Kerns et al., 1991; Weiss & Kerns, 1995), suggesting that these responses may serve a similarly reinforcing function. These distracting responses are responses meant to help the person in pain take his or her mind off the pain, by doing such things as reading to the individual, turning on the television, or talking to him or her about something else than the pain.

Instead of examining the role of solicitous spousal responses, Gil and colleagues (1987) examined the impact of social support (as assessed by the Social Support Questionnaire or SSQ; Sarason, Levine, Basham, & Sarason, 1983) on pain behavior and found that pain patients who reported high satisfaction with social support exhibited higher levels of pain behaviors, such as guarding and rubbing of the painful area than those who reported low satisfaction with social support.

While the constructs of social support and spousal solicitousness are similar and likely measure a similar underlying construct, they do appear to draw upon distinct aspects of that construct. Kerns et al. (1985) found that both the solicitous responses and support scales, along with the distracting responses scales of the of the West Haven-Yale Multidimensional Pain Inventory (WHYMPI), loaded on the same factor, a factor which they interpreted as representing support from significant others. In addition, they found a moderate correlation between the solicitous responses and the support scales of the WHYMPI ($r = .056, p < .05$). Similarly, in their study, Paulsen and Altmaier (1995) found a moderate correlation between the WHYMPI perceived solicitous responses scale and social support, as measured by the Social Provisions Scale (SPS; Cutrona & Russell, 1987) ($r = .045, p < .05$). These correlations would be expected to be higher if the

constructs of solicitous responses and support were interchangeable. The fact that these constructs are different is also suggested by the fact that some studies that examined social support found results that go against the operant theory of pain. For example, Kerns and Turk (1984) found that spouse support, as defined by reports of a helpful attitude, attentiveness, concern, and a lack of negative or critical attitude on the part of the spouse, was marginally negatively correlated with patients' reports of pain intensity. In addition, in their study, Paulsen and Altmaier found that patients perceiving higher levels of solicitous responses from their spouses displayed a greater number of pain behaviors than those perceiving low levels of solicitous responses. This finding occurred whether the spouse was present or absent. However, when examining the construct of social support, patients perceiving a high level of social support from their spouse only displayed a greater number of pain behaviors when their spouse was absent, a finding that goes against the operant model.

Because the construct of solicitous responses has not only more widely been examined in the context of partner response to pain behaviors, but also appears to be more pertinent to the operant model of pain, this is the construct that was examined in the present study. In addition, although both spouses' self-reported responses to patients' pain and patients' own perception of spousal responses have been found to be predictive of patients' pain, patients' perception of spousal responses have been found to be a stronger predictor (Flor et al., 1989) and were thus the types of spousal responses that were examined in the present study.

In addition to being solicitous in nature, responses from others may also be perceived as punishing. Punishing responses include such things as ignoring the person in

pain or expressing anger or frustration at the person when he or she is in pain. These types of responses have been found to be associated with greater activity among chronic pain patients (Flor, Kerns, & Turk, 1987) and with less intense self-reported pain among arthritic pain patients (Faucett & Levine, 1991).

The combination of significant others' responses to expressions of pain and patients' avoidance of aversive pain generating experiences such as physical activity, as well as the fact that chronic back pain patients may be more easily influenced by operant conditioning factors than healthy controls (Flor, Knost, & Birbaumer, 2002), can lead to the development of a vicious cycle that results in the maintenance of the chronic pain problem. Indeed, reinforcement from significant others may lead to more frequent expressions of distress that elicit additional positive reinforcement and subsequently more pain behaviors.

In summary, findings relating to the role of spouses in the pain experience suggest that pain-related solicitous responding, as perceived by the patients and as reported by spouses, are associated with patients' reports of pain and disability, as well as increased frequency of observed pain behaviors. Conversely, withdrawal of attention from pain behaviors, positive reinforcement of activity, as well as punishing responses are associated with greater activity, less intense self-reported pain, and decreases in pain behaviors among chronic pain patients.

It is noteworthy that none of the studies mentioned in this section about the role of the partner in the pain experience included the ethnic and racial breakdown of their study sample. Thus, it is not clear if any ethnic minorities were even included in these studies. The present study was designed to extend the findings of the literature on the reinforcing

power of spouses and partners on self-reported pain severity and to address the lack of attention to cultural factors in the existing literature by examining the role of cultural indicators among Mexican Americans in these interactional processes, and specifically focusing on the role of solicitous partner responses and punishing partner responses, the two types of partner responses that have been the most widely researched.

Because literature suggests that males and females differ considerably in response to their respective spouses' distress (e.g., Rohrbaugh, et al., 2002), the present study was limited to examining these interactional processes in males in heterosexual relationships, so as to avoid interactions of gender and perceived partner responses.

The Role of the Spouse on Depressive Symptomatology Among Pain Patients

Because of the high level of comorbidity between depression and chronic pain, it was important to examine depressive symptomatology as an outcome variable, in addition to pain severity. Depression was particularly well suited for examination in the the present study given that reports of both depressive symptoms and pain severity have been found to be associated with spousal responses. Indeed, while studies on the impact of spousal responses on the pain patient suggest that solicitous responses from one's spouse for one's expressions of pain are related to both more frequent pain behavior and lower levels of depression (Kerns et al., 1990), it is the negative aspects of social interactions, rather than solicitous or supportive responses, that appear to be more predictive of depressive symptomatology. In particular, the types of responses that are most highly associated with depressive symptom severity are those that are perceived as punishing behaviors (Kerns et al., 1990; Kerns et al., 1991; Turk, Kerns, & Rosenberg, 1992). For example, a patient who is experiencing a moderate amount of pain but who

perceives that he or she receives punishing responses may experience high levels of depression. On the other hand, a supportive spouse may, in fact, be rewarding pain behaviors and reports of increased pain, while at the same time reducing the likelihood of significant depression (Block et al., 1980).

The present study was designed to extend the findings of the literature on partner responses and depression by examining how cultural factors interact with partner responses to impact depressive symptomatology among married and cohabiting Mexican American men.

Marital Satisfaction and the Pain Experience

In terms of marital satisfaction, pain patients with depression and persistent pain have been found to exhibit lower levels of marital satisfaction than matched controls with depression and no pain (Mohamed, et al., 1978). In their study, Flor, Turk, et al. (1987) found that two thirds of pain patients reported that their pain had negatively affected their marital relationship.

While not all studies that have examined the role of partner responses on pain severity or depression have examined marital satisfaction, it was important to examine the role of this variable in the present study because of its association with pain-related experiences for patients in several studies. For example, Flor, Turk, et al. (1987) found that patients with more solicitous spouses tended to be more satisfied with their marital relationships. In addition, Turk et al. (1992) found that spousal solicitousness was only related to reported pain intensity in the context of a satisfying marital relationship. These authors suggest that spousal solicitousness may be reinforcing only when patients value the attention, or perceive the responses as well meaning.

Marital satisfaction has also been found to play a role in the report of depressive symptoms among chronic pain patients. For example, Kerns and Turk (1984) demonstrated that reports of depression severity among chronic pain patients were inversely correlated with both patients' perceptions of marital satisfaction and perceived levels of spousal solicitousness. Similarly, Kerns et al. (1990) found that, in the context of an unsatisfying marital relationship, but not in the context of a satisfying marital relationship, the perception of relatively high levels of punishing responses from the spouse was associated with significant increases in self-report of depressive symptoms. These authors note that such findings suggest that marital support may be disrupted as the chronic pain problem develops, resulting in lower levels of marital satisfaction and in the development and maintenance of depressive symptoms.

Weiss and Kerns (1995) looked at the interactions between perceived spousal responses and marital satisfaction in predicting pain severity among a sample of married chronic pain patients recruited from a Department of Veterans Affairs Medical Center in Connecticut. They found that patients who were satisfied in their relationship and perceived their spouses to be high on punishing responses and low on solicitous responses reported low levels of pain severity. Maritally satisfied patients who fit this pattern and, in addition, perceived their spouses to be high on distracting responses, reported the lowest levels of pain severity among all the groups. On the other hand, maritally unsatisfied patients with similar perceptions of their spouses (perceived high punishing, low solicitous, and high distracting responses) had the highest degree of reported pain severity. According to Weiss and Kerns, the results of their study suggest that, in satisfying relationships, pain patients may be less likely to view the spouse's

behaviors as unsupportive and may attribute positive motivations for the spouse's responses, thus resulting in a decrease in pain behaviors as a way to please their spouse. Weiss and Kerns further suggest that, in maritally satisfied relationships, spouses who respond to overt displays of pain with punishing and distracting responses may help patients to focus their attention on something other than their pain. In maritally distressed relationships, however, distracting and punishing responses may together convey a message to the patient that the spouse is unconcerned with the patient's pain and wants them to cease engaging in pain behaviors, behaviors which they find undesirable.

In summary, marital satisfaction has been found to be positively associated with spousal solicitous responses and negatively associated with self-reported depression in correlational studies. Findings from studies that have looked at the moderating role of marital satisfaction on pain severity and depression indicate that spousal solicitous responses may only be related to self-reported pain severity in the context of a satisfying marital relationship, while spousal punishing responses may be most predictive of self-reported depressive symptoms in the context of unsatisfying marital relationships. When distracting responses are examined, the combination of perceived high punishing, low solicitous, and high distracting responses is associated with low levels of self-reported pain severity among maritally satisfied individuals, while this same combination of perceived spousal responses is associated with high levels of self-reported pain severity among maritally unsatisfied individuals.

Based on these findings, the present study examined the associations between relationship satisfaction, perceived punishing partner responses, perceived solicitous partner responses, self-reported pain severity, and self-reported depressive

symptomatology among a sample of Mexican American men. In addition, the present study examined the possible interaction of relationship satisfaction with perceived partner responses and cultural indicators, so as to determine if the moderating role played by relationship satisfaction between perceived partner responses and pain severity or depressive symptomatology manifested itself differently among a sample of Mexican American men than among non-ethnically diverse samples in which the role of cultural indicators was not examined.

Pain Experiences Among Hispanics

While there have been many proposed conceptual models of pain perception (e.g., Ciccone & Grzesiak, 1984; Merskey, 1975; Turk, Meichenbaum, & Genest, 1983; Weisenberg, 1977), only a few models have included cultural influences on pain perception (e.g., Bates, 1987; Meinhart & McCaffery, 1983). While these models suggest that cultural beliefs and values influence reactions to painful experiences, the most comprehensive model is the one proposed by the cultural anthropologist Maryann Bates (1987). According to Bates' model, pain is more than a physiologic response to a painful stimulus; it is a biocultural phenomenon. Bates' biocultural model, which integrates aspects of gate control theory¹ (Melzack & Wall, 1965) with social learning and social comparison theories (Bandura, 1977; Festinger, 1954), posits that attitudes, expectations, and appropriate emotional expressiveness are learned through observing the reactions and behaviors of others who are similar to oneself. These culturally acquired patterns may influence the neuropsychological processing of nociceptive information as well as

¹ According to the gate-control theory of pain, there is a "gating system" in the central nervous system that regulates the transmission and the intensity of nerve signals. The fundamental basis for this theory is the belief that psychological as well as physical factors guide the brain's interpretation of painful sensations.

psychological, behavioral and verbal responses to pain. Two classic early studies (Zborowski, 1969; Zola, 1966), as well as more recent studies (e.g., Garro, 1990; Riley, et al., 2002; Sheffield, et al., 2000) on the relationship between culture and pain indeed found that reactions to pain varied by cultural group and reflected the beliefs of the group. Thus, it is clear that to better understand the pain experience, an exploration of the role of cultural indicators in the experience of pain is essential.

A few empirical studies have examined the ways Hispanics describe their pain in comparison to other ethnic groups. Meinhart and McCaffery (1983) found differences between Hispanic and Caucasian individuals in their descriptions of pain. In comparison to the Caucasian individuals, the descriptions by the Hispanic individuals were consistent with the beliefs of fatalism, stoicism and self-restraint reported as valued in the Hispanic culture. In a study conducted by Lipton and Marbach (1980), ethnic differences in 166 patients with chronic facial pain of unknown origin were studied. The groups studied included Hispanic, Black, Jewish, Italian, Irish, and White Protestant patients. The emotional responses to pain such as tears or moans were similar but there were distinct differences in how patients viewed and described their pain. In that study, Hispanics were less willing to admit loss of control and less likely to describe their pain as unbearable, compared to the other groups.

Several other studies have looked at how the degree of assimilation and acculturation to U.S. society affects the pain experience of various ethnic groups. For example, a study focusing on the interethnic differences and similarities in the facial pain of African Americans, Irish, Italians, Jews, and Puerto Ricans found that degree of assimilation into the U.S. culture was strongly related to patient's symptoms, behaviors,

and attitudes (Lipton & Marbach, 1984). According to Zatzick and Dimsdale (1990), first and second generation immigrants are more likely to retain beliefs and behaviors specific to their culture that may influence the response to painful stimuli. In contrast, more assimilated generations are less likely to retain these behaviorally significant aspects of ethnicity. Because of the important impact of acculturation and generational status on the pain experience of members of different ethnic groups, the present study examined the specific role that these two cultural indicators might have on the pain experience of Mexican Americans.

Among Hispanics, several characteristic patterns of social interaction or “cultural scripts” have been identified. These cultural scripts include: *simpatía*, or need for pleasant social relationships (Marin & Marin, 1991), *familismo*, or family interdependence, which represents the idea that Hispanics maintain strong feelings of loyalty, reciprocity, and solidarity (Marin & Marin, 1991), while protecting family members both emotionally and physically (Cohen, 1979), *personalismo*, or the building of personal relationships and a desire for personal connectedness (Falicov, 1996), and sex-based division of power within the family (Marin & Marin, 1991). Fisher and colleagues (2000) have suggested that these cultural scripts could have implications for the management of illnesses. By extension, it is likely that these cultural scripts have relevance to the pain experience.

Triandis, Marín, Lisansky, and Betancourt (1984) elaborated on the cultural script of *simpatía*, defining it as a personal quality that describes an individual who is likable, behaves with dignity and respect toward others, and strives for harmony in interpersonal relations, as well as avoidance of interpersonal conflict. This concern for the avoidance of

interpersonal conflict may be based on the Hispanic cultural values of respect and worthiness (Triandis, et al., 1984). Thus, behaviors that are interpreted as criticisms are perceived by Hispanics as assaults on the other person's dignity (Tumin & Feldman, 1971). Research does suggest that Hispanics strive for conflict avoidance (Kagan, Knight & Martinez-Romero, 1982; Kagan & Madsen, 1972), that Hispanics are more likely than non-Hispanics to expect high frequencies of positive social behaviors and low frequencies of negative social behaviors, and that they are likely to perceive as negative those behaviors that are considered neutral by non-Hispanics, while behaviors that are perceived as positive by non-Hispanics are likely to be perceived as neutral by Hispanics (Triandis, et al., 1984). In addition, Hispanics who are more acculturated have been found to show a reduction in the intensity of the *simpatía* script (Triandis, Kashima, Shimada, & Villareal, 1986). In that study, Triandis and colleagues measured *simpatía* through ratings of 28 positive and 27 negative behavior items consisting of roles (e.g., mother-son) and behaviors (e.g., admire), on which subjects were asked to indicate on a 10-point scale whether the first member of the role was likely to engage in the particular behavior with the second member of role.

While it is likely that, based on this cultural script perspective, cultural factors define how patients and families respond to and manage health issues and physical pain, there is still a lack of research that has explored the links between pain experiences and corresponding cultural scripts among couples of any ethnic and cultural group. However, research on Hispanic couples in which one member suffers from an illness is useful in getting a better sense of how cultural differences may impact pain experiences among Hispanic couples. In a study that looked at how Hispanic and Caucasian couples resolved

differences of opinion about diabetes management, Hispanic couples were found to display more warmth, be less avoidant in the case of dyads composed of a male patient, be less hostile toward each other, and have a less dominant patient member than Caucasian couples; however, Hispanic couples were found to achieve less problem resolution and were more frequently off-task than Caucasian couples (Fisher et al., 2000). While this research did not examine what it is about the Hispanic culture that may contribute to differing ways for couples to deal with illness management, nor did it assess cultural scripts, it is possible that the differences that emerged stem from Hispanics' higher likelihood of adhering to the above-mentioned cultural scripts than Caucasians.

Because the *simpatía* script appeared particularly suited to exploring the pain experience of Mexican American individuals within the context of their relationship with their partner and was the only cultural script that had been studied empirically, this was the cultural script that I focused on in the present study. *Simpatía* along with acculturation and generational status were the three cultural indicators examined in this study, with the goal of assessing how perceived partner punishing responses and perceived partner solicitous responses interact with relationship satisfaction to impact depressive symptomatology and pain severity among Mexican Americans at varying levels of each cultural indicator differently. The assumption, which was tested as part of this study, was that, because of the above-mentioned finding that Hispanics (and thus the Hispanic subgroup of Mexican Americans) expect higher frequencies of positive behaviors and lower frequencies of negative behaviors in the context of social relationships than non-Hispanics, perceived partner responses (both solicitous partner responses and punishing partner responses) and the cultural indicators (*simpatía*,

acculturation, and generational status) would interact and that this interaction would be a significant predictor of relationship satisfaction. Based on this assumption, the study then examined whether an examination of the role of the cultural indicators (and principally *simpatia*, as the most direct measure of the tendency among Hispanics to expect higher frequencies of positive behaviors and lower frequencies of negative behaviors) translated, when compared to the results of studies conducted on non-specifically Hispanic populations, as more negative outcomes in terms of depression and pain severity in the face of high levels of perceived punishing partner responses for Mexican Americans who were first generation U.S. residents, low in acculturation, and high in *simpatia*, than for those at the other side of the continuum on these three cultural indicators. Thus, unlike findings that indicate that, in samples comprised mostly of non-Hispanic White participants, it is only in the context of an unsatisfying marital relationship that the perception of relatively high levels of punishing responses from the spouse is associated with significant increases in self-report of depressive symptoms, the present study examined the possibility that this finding would only hold true for the more acculturated participants, those who had been in the U.S. for a greater number of generations, and those who were low in *simpatia*, but would not hold true for those participants at the other side of the continuum on these three cultural indicators. For those participants, it was expected that perceived punishing responses would not only be associated with increased self-reported depressive symptoms, regardless of relationship satisfaction, but would also be associated with increased pain severity, because of being interpreted as negative social behaviors (with the assumption being that these perceptions of negative social behaviors/perceived partner responses would negatively impact depressive

symptoms and pain severity among Mexican Americans). Low levels of perceived solicitous responses were expected to be associated with similar findings as those involving high levels of perceived punishing responses. Thus, the present study examined the possibility that low levels of solicitous responses would be associated with increased self-reported pain severity (contrary to the operant model) and increased self-reported depression among the less acculturated participants, those who had been in the U.S. for fewer generations, and those who were high in *simpatia*, regardless of relationship satisfaction. For those on the other side of the continuum on these three cultural indicators, however, low levels of solicitous responses were expected to be associated with low levels of self-reported pain severity and depression only in those who were satisfied with their relationship. In addition, it was expected that there would likely be few individuals among those who were first generation U.S. residents, low in acculturation, and high in *simpatia* who would experience high levels of perceived punishing responses or low levels of perceived solicitous responses in the context of a satisfying relationship with their partner. This was expected because these types of responses would tend to be perceived as negative social behaviors that would negatively impact relationship satisfaction among those individuals. Based on this, it was hypothesized that the restricted range among the individuals on that particular end of the continuum on the cultural indicators would result in a pattern whereby the association between the perceived partner responses and relationship satisfaction would be stronger than for the individuals at the other end of the continuum on the cultural variables.

In addition, based on the findings from the marital literature that suggest that negative interactions between partners more powerfully affect relationships than do

positive interactions (Gottman, 1994; Markman & Hahlweg, 1993), it was expected that the results from the analyses involving the perceived solicitous responses would be weaker than those involving the perceived punishing responses.

The Present Study

This study's main goal was to gain a better understanding of the role of cultural indicators in moderating the influence of perceived spousal responses on pain severity and depressive symptomatology. Specifically, this study examined how relationship satisfaction, perceived partner punishing responses, and perceived partner solicitous responses interacted to predict depressive symptomatology and pain severity in Mexican Americans. The constructs of *simpatía*, acculturation, and generational status were included in the analyses to examine if findings were moderated by these cultural indicators.

Hypotheses

Hypothesis 1. The three cultural measures (acculturation, *simpatía*, and generational status) were expected to be highly correlated with each other. Each of these three cultural measures was also expected to be correlated with family income. Specifically, family income was expected to be positively correlated with level of acculturation, positively correlated with generational status, and negatively correlated with adherence to the cultural script of *simpatía*.

Hypothesis 2. Perceived partner responses (punishing responses and solicitous responses) were expected to be correlated with pain severity, depressive symptomatology, and relationship satisfaction. Specifically, the variable of perceived punishing responses was expected to be positively correlated with pain severity, positively correlated with

depressive symptomatology, and negatively correlated with relationship satisfaction, while the variable of perceived solicitous responses was expected to be negatively correlated with pain severity, negatively correlated with depressive symptomatology, and positively correlated with relationship satisfaction. Perceived punishing responses and perceived solicitous responses were expected to be negatively correlated with one another, while pain severity and depressive symptomatology were expected to be positively correlated with one another. Relationship satisfaction was expected to be negatively correlated with pain severity and depressive symptomatology.

Hypothesis 3: The interaction of perceived punishing responses by the cultural indicators (*simpatía*, acculturation, and generational status) was expected to be a significant predictor of relationship satisfaction.

1. Specifically, the interaction of perceived punishing responses by *simpatía* was expected to be a significant predictor of relationship satisfaction. Thus, when perceived punishing responses were low, the expectation was that the group high in *simpatía* would have higher relationship satisfaction than the group low in *simpatía*.
2. The interaction of perceived punishing responses by acculturation was expected to be a significant predictor of relationship satisfaction. Specifically, when perceived punishing responses were low, the less acculturated group was expected to have higher relationship satisfaction than the more acculturated group.
3. Similarly, the interaction of perceived punishing responses by generational status was expected to be a significant predictor of relationship satisfaction. When perceived punishing responses were low, it was expected that individuals whose

families had been U.S. residents for fewer generations would have higher relationship satisfaction than individuals whose families had been U.S. residents for a greater number of generations.

Hypothesis 4: The interaction of perceived solicitous responses by the cultural indicators (*simpatía*, acculturation, and generational status) was expected to be a significant predictor of relationship satisfaction. These results were hypothesized to be weaker than the perceived punishing responses-based results.

1. Specifically, the interaction of perceived solicitous responses by *simpatía* was expected to be a significant predictor of relationship satisfaction. Thus, when perceived solicitous responses were high, the expectation was that the group high in *simpatía* would have higher relationship satisfaction than the group low in *simpatía*.
2. The interaction of perceived solicitous responses by acculturation was expected to be a significant predictor of relationship satisfaction. Specifically, when perceived solicitous responses were high, the less acculturated group was expected to have higher relationship satisfaction than the more acculturated group.
3. Similarly, the interaction of perceived solicitous responses by generational status was expected to be a significant predictor of relationship satisfaction. When perceived solicitous responses were high, it was expected that individuals whose families had been U.S. residents for fewer generations would have higher relationship satisfaction than individuals whose families had been U.S. residents for a greater number of generations.

Hypothesis 5: The three cultural indicators (*simpatía*, acculturation, and generational status) were expected to significantly interact with perceived punishing responses and relationship satisfaction to impact pain severity and depressive symptomatology among Mexican Americans at varying levels of each cultural indicator differently.

1. Thus, with regard to the cultural indicator of *simpatía*, it was expected that there would be a significant *simpatía* by perceived punishing responses by relationship satisfaction interaction for pain severity and depressive symptomatology. Specifically, it was expected that, among Mexican Americans who were low in *simpatía*, those individuals who perceived their partners to be more punishing would report high levels of depressive symptomatology if they were unsatisfied in their relationship and would report lower levels of depressive symptomatology if they were satisfied in their relationship. In addition, among Mexican Americans who were low in *simpatía*, those individuals who perceived their partners to be more punishing were expected to report high levels of pain severity if they were unsatisfied in their relationship, but low levels of pain severity if they were satisfied in their relationship. However, in the case of Mexican American individuals who were high in *simpatía*, those individuals who perceived their partners to be high in punishing responses were expected to report high levels of depressive symptomatology and pain severity, regardless of their level of relationship satisfaction. The converse (in terms of depressive symptomatology and pain severity) was expected for those who perceived their partners to be low in punishing responses. Secondly, it was expected that the association between

punishing responses and relationship satisfaction would be relatively strong when *simpatía* was low whereas it would be weaker when *simpatía* was high.

2. With regard to the cultural indicator of acculturation, it was expected that there would be a significant acculturation by perceived punishing responses by relationship satisfaction interaction for pain severity and depressive symptomatology. Specifically, it was expected that, among acculturated Mexican Americans, those individuals who perceived their partners to be more punishing would report high levels of depressive symptomatology if they were unsatisfied in their relationship and would report lower levels of depressive symptomatology if they were satisfied in their relationship. In addition, among acculturated Mexican Americans, those individuals who perceived their partners to be more punishing were expected to report high levels of pain severity if they were unsatisfied in their relationship, but low levels of pain severity if they were satisfied in their relationship. However, in the case of Mexican American individuals who were less acculturated, those individuals who perceived their partners to be high in punishing responses were expected to report high levels of depressive symptomatology and pain severity, regardless of their level of relationship satisfaction. The converse (in terms of depressive symptomatology and pain severity) was expected for those who perceived their partners to be low in punishing responses. Secondly, it was expected that the association between punishing responses and relationship satisfaction would be relatively strong when acculturation was high whereas it would be weaker when acculturation was low.

3. With regard to the cultural indicator of generational status, it was expected that there would be a significant generational status by perceived punishing responses by relationship satisfaction interaction for pain severity and depressive symptomatology. Specifically, it was expected that, among Mexican Americans who were born in the U.S. or whose families had been in the U.S. for several generations, those individuals who perceived their partners to be more punishing would report high levels of depressive symptomatology if they were unsatisfied in their relationship and would report lower levels of depressive symptomatology if they were satisfied in their relationship. In addition, among Mexican Americans who were born in the U.S. or whose families had been in the U.S. for several generations, those individuals who perceived their partners to be more punishing were expected to report high levels of pain severity if they were unsatisfied in their relationship, but low levels of pain severity if they were satisfied in their relationship. However, in the case of first generation Mexican American individuals, those individuals who perceived their partners to be high in punishing responses were expected to report high levels of depressive symptomatology and pain severity, regardless of their level of relationship satisfaction. The converse (in terms of depressive symptomatology and pain severity) was expected for those who perceived their partners to be low in punishing responses. Secondly, it was expected that the association between punishing responses and relationship satisfaction would be relatively strong for the group that had been in the U.S. for a greater number of generations

whereas it would be weaker for the group that had been in the U.S. for fewer generations.

Hypothesis 6: The three cultural indicators (*simpatía*, acculturation, and generational status) were expected to significantly interact with perceived solicitous responses and relationship satisfaction to impact pain severity and depressive symptomatology among Mexican Americans at varying levels of each cultural indicator differently. These results were hypothesized to be weaker than the perceived punishing responses-based results.

1. With regard to the cultural indicator of *simpatia*, it was expected that there would be a significant *simpatia* by perceived solicitous responses by relationship satisfaction interaction for pain severity and depressive symptomatology. Specifically, it was expected that, among Mexican Americans who were low in *simpatía*, those individuals who perceived their partners to be less solicitous would report low levels of pain severity if they were satisfied in their relationship and would report higher levels of pain severity if they were unsatisfied in their relationship. In addition, among Mexican Americans who were low in *simpatía*, those individuals who perceived their partners to be less solicitous were expected to report high levels of depressive symptomatology if they were unsatisfied in their relationship and lower levels of depressive symptomatology if they were satisfied in their relationship. However, in the case of Mexican American individuals who were high in *simpatía*, those individuals who perceived their partners to be low in solicitous responses were expected to report high levels of depressive symptomatology and pain severity, regardless of their level of

relationship satisfaction. The converse (in terms of depressive symptomatology and pain severity) was expected for those who perceived their partners to be high in solicitous responses. Secondly, it was expected that the association between solicitous responses and relationship satisfaction would be relatively strong when *simpatia* was low whereas it would be weaker when *simpatia* was high.

2. With regard to the cultural indicator of acculturation, it was expected that there would be a significant acculturation by perceived solicitous responses by relationship satisfaction interaction for pain severity and depressive symptomatology. Specifically, it was expected that, among highly acculturated Mexican Americans, those individuals who perceived their partners to be less solicitous would report low levels of pain severity if they were satisfied in their relationship and would report higher levels of pain severity if they were unsatisfied in their relationship. In addition, among acculturated Mexican Americans, those individuals who perceived their partners to be less solicitous were expected to report high levels of depressive symptomatology if they were unsatisfied in their relationship and lower levels of depressive symptomatology if they were satisfied in their relationship. However, in the case of Mexican American individuals who were less acculturated, those individuals who perceived their partners to be low in solicitous responses were expected to report high levels of depressive symptomatology and pain severity, regardless of their level of relationship satisfaction. The converse (in terms of depressive symptomatology and pain

severity) was expected for those who perceived their partners to be high in solicitous responses. Secondly, it was expected that the association between solicitous responses and relationship satisfaction would be relatively strong when acculturation was high whereas it would be weaker when acculturation was low.

3. With regard to the cultural indicator of generational status, it was expected that there would be a significant generational status by perceived solicitous responses by relationship satisfaction interaction for pain severity and depressive symptomatology. Specifically, it was expected that, among Mexican Americans who were born in the U.S. or whose families had been in the U.S. for several generations, those individuals who perceived their partners to be less solicitous would report low levels of pain severity if they were satisfied in their relationship and would report higher levels of pain severity if they were unsatisfied in their relationship. In addition, among Mexican Americans who were born in the U.S. or whose families had been in the U.S. for several generations, those individuals who perceived their partners to be less solicitous were expected to report high levels of depressive symptomatology if they were unsatisfied in their relationship and lower levels of depressive symptomatology if they were satisfied in their relationship. However, in the case of first generation Mexican American, those individuals who perceived their partners to be low in solicitous responses were expected to report high levels of depressive symptomatology and pain severity, regardless of their level of relationship satisfaction. The converse (in terms of

depressive symptomatology and pain severity) was expected for those who perceived their partners to be high in solicitous responses. Secondly, it was expected that the association between solicitous responses and relationship satisfaction would be relatively strong for the group that had been in the U.S. for a greater number of generations whereas it would be weaker for the group that had been in the U.S. for fewer generations.

Method

Participants

Participants in the final sample were 62 married or cohabiting men with chronic pain back and/or neck pain (71% of the sample had back pain as their primary pain complaint, 14.5% had neck pain as their primary pain complaint, and 14.5% suffered from both back and neck pain). Among the 62 participants, 32 (52%) were married and 30 (48%) were cohabiting men. Forty-eight percent of participants were recruited from the L.A. community, 29% of participants were recruited from medical clinics in the South Bay and Monterey Bay areas, and 23% were recruited from hospitals and medical clinics in the Denver area. The participants' mean level of relationship satisfaction was 48 (out of 78), indicating that the sample's mean level of relationship fell in the "neutral" to "slightly satisfied" range of relationship satisfaction. There were no significant differences between the married and cohabiting men on this measure. The married and cohabiting groups showed no differences on most demographic variables, except for age, $t(60) = 2.23, p < .05$ (two-tailed), with married men being older than cohabiting men (mean age for married men = 44.6, $SD = 12.2$, mean age for cohabiting men = 37.6, $SD = 12.52$), number of children, $t(60) = 2.36, p < .05$ (two-tailed), with married men having more children than cohabiting men (mean number of children for married men = 2.1, $SD = 1.6$, mean number of children for cohabiting men = 1.2, $SD = 1.4$), and amount of time living with their partner, $t(58) = 3.69, p < .01$ (two-tailed), with married men having lived with their partner for longer than cohabiting men (mean number of years living together

with spouse for married men = 14.7, $SD = 12.4$, mean number of years living together with partner for cohabiting men = 5.1, $SD = 5.2$). In terms of ethnicity, all participants identified as Mexican, Mexican American, or Chicano. With regard to race, one participant was Black, two were Native American and 59 were Caucasian. Eighty percent of the sample was Catholic, 8% of the individuals wrote in “None/No religion,” 3% of the sample was Protestant, 3% was Seventh-day Adventist, 3% was Jehovah’s Witnesses, 1.6% (one individual) was Mormon, and one individual (1.6%) did not write in any religion, but wrote “I only believe in our Creator.” The mean duration of pain was 9.7 years ($SD = 11.8$) and 16% of the sample had undergone surgery for their pain complaint. With regard to educational level, the sample’s mean highest level obtained was 11.8 or eleventh grade ($SD = 2.9$). The sample’s mean household income was \$22,738 ($SD = \$15,789$). In terms of generational status, the sample was comprised of 66% of individuals who were first generation American residents (i.e., they were born in Mexico), 11% of individuals who were second generation Americans (i.e., they were born in the U.S.; either one of their parents was born in Mexico or another country), 10% of individuals who were third generation Americans (i.e., they and their parents were born in the U.S. and at least one grandparent was born in Mexico or another country with remainder being born in the U.S.), none who were fourth generation Americans, and 13% of individuals who were fifth generation Americans (i.e., they, their parents, and all their grandparents were born in the U.S.). In terms of acculturation levels, 22% of individuals had scores that placed them in the “very Mexican oriented” range, 48% fell in the “Mexican oriented to approximately balanced bicultural” range, 14% fell in the “slightly Anglo oriented bicultural” range, 11% fell in the “strongly Anglo oriented” range, and

3% fell in the very assimilated range. Tables 1 and 2 report background information on the sample of participants included in this study.

Procedure

I recruited participants from three hospitals in the Denver area (Denver Health Medical Center's Rehabilitation Medicine department, the VA Eastern Colorado Health Care System Pain Clinic, and the University of Colorado Hospital Spine Center), the Pain Clinic of Monterey Bay, the Pain Management Center at Stanford University, a private psychology practice in Watsonville, California, as well as communities in Los Angeles and Napa Valley. By recruiting participants from varied geographical locations and including both community participants and participants recruited from hospitals and health clinics, my goal was to not only obtain a sample that was more highly representative of Mexican Americans across the U.S. than if I had sampled from only one geographical location, but also to increase the likelihood that I would have participants who represented as many different levels of acculturation as possible.

At the Denver Health Medical Center's Rehabilitation Medicine department and the University of Colorado Hospital Spine Center, participants were recruited retrospectively by one of their treating providers, namely staff physicians working at the Denver Health Medical Center. A Physical Medicine & Rehabilitation resident working at each site retrospectively identified male patients who had been seen at the Denver Health Medical Center and the University of Colorado Hospital, who had a diagnosis of back and/or neck pain, and whose records indicated that they were Hispanic. He sent these patients a letter written in English and Spanish and signed by the patients' treating provider that outlined the study and informed those who were interested to send back to

their treating provider in the pre-stamped addressed envelope an enclosed Authorization form (to allow permission to use participants' Personal Health Information for research purposes), along with an enclosed contact information form that asked for current address, phone number, and good times to call them upon receipt of their forms (see Appendix A for recruitment letter and contact information form). At the VA Eastern Colorado Healthcare System, I recruited participants through flyers (see Appendix B for a copy of the flyer) that were posted at the Denver VA Medical Center primary care clinics and Community Based Outpatient Clinics (San Luis Valley VA CBOC, Aurora VA CBOC, Colorado Springs VA CBOC, La Junta VA CBOC, Lakewood VA CBOC, Lamar VA CBOC, and Pueblo VA CBOC).

I used two different authorization forms in the study. An Authorization form A ("Authorization To Release Health Information About Me For Research Purposes") was sent to participants recruited from the Denver Health Medical Center and from the University of Colorado Hospital. An Authorization form B ("Authorization To Use Or Release Health Information About Me For Research Purposes") was sent to participants recruited from the VA Eastern Colorado Healthcare System (see Appendix C for a copy of Authorization forms A and B).

Once I received the authorization forms that were sent back to the providers, I contacted each participant and assessed whether he met all the criteria for inclusion in the study: male, currently married or cohabiting, self-identifying as Mexican American or Chicano, at least 21 years of age, experiencing back and/or neck pain for at least three months (three months is the suggested point of division between acute and chronic pain suggested by the International Association for the Study of Pain; IASP, 1986), and able to

read and write in English and/or Spanish. A potential participant may have been recruited on the basis of his Hispanic ethnicity. However, he did not qualify for the study if he answered “no” to my question, “Do you identify yourself as Mexican, Mexican American, or Chicano?” Two individuals responded “no” to this question and then indicated that they or their families did not come from Mexico, but from a different Central American or Latin American country.

In the case of community participants recruited from the L.A. and Napa Valley areas, I returned their call in response to an advertisement placed in a newspaper (the advertisement was in English in the case of the Napa Valley-based newspaper and in Spanish in the case of the L.A.-based newspaper, which is a Spanish-language newspaper) (see Appendix D for a copy of the advertisement). Participants recruited from the Pain Clinic of Monterey Bay, the Pain Management Center at Stanford University, and a private psychology practice in Watsonville, California found out about the study through flyers posted in the treating providers’ clinics and were contacted after they made the initial call to inquire about the study.

During my initial phone conversation with participants, I informed them that the study was a questionnaire-based study that involved filling out questionnaires that included questions regarding their experience of pain, mood, relationship with their partner/spouse, and cultural indicators. I told them about the approximate amount of time required to complete these questionnaires and informed them of the payment they would receive for their participation. I then assessed whether the individual was still interested in participating. If he was, I assessed whether he met the criteria for inclusion in the study, just as I did for participants recruited from the various hospitals.

If the participant (whether recruited from a hospital or the community) met eligibility criteria, I informed him that I would be sending him a packet of questionnaires and the consent form. I asked him if he wished to be sent a packet of questionnaires in English, Spanish, or both, and informed him that I would need to contact him once again by phone in approximately 10 days to go over the consent form with him and answer any questions he might have after he received the questionnaires. I set a specific date with him to contact him again by phone. I informed him that he should have his packet with him at the scheduled time. The packet included a cover letter, a consent form (and a consent form copy for their records), the questionnaires, a copy of their signed Authorization form in the case of participants recruited from hospitals that required it, a different Authorization form for them to fill out and return to me in the case of participants recruited from the Denver Health Medical Center and the University of Colorado Hospital (and a copy for their records), as well as a referral document with contact information for mental health centers, hospitals, and crisis hotlines in their area they could turn to for help if they were experiencing any difficulties (see Appendix E for a model of a questionnaire packet, including a consent form, the questionnaires, and a referral document).

Approximately 10 days after the first phone conversation, at the time agreed upon during our first conversation, I contacted the participant. I asked him if he had received the packet and if he had the packet with him or was easily able to get it. If the participant did not have access to the packet, another time to go over the consent form was scheduled. During this second phone conversation, I explained the project to the participant. I then reviewed the points that were included in the consent form, including

the purpose of the study, study procedures, potential risks and benefits, procedures to safeguard confidentiality and well-being of participants, and the fact that information regarding child abuse and neglect, homicide, or suicide shared during this phone conversation constituted an exception to the guarantee of confidentiality and would be appropriately reported. I also explained that he would need to send the questionnaires back, along with the signed consent form (and his signed Authorization forms if he had been recruited from hospitals that required the forms), to receive his payment. I then informed him that taking part in this study was voluntary and that he had the right not to take part in the study or to withdraw from the study at any time. If the participant had been recruited from a hospital, I added that not taking part in the study or withdrawing from the study would not result in any loss of benefits or medical care to which he was entitled. I asked the participant if he had any questions. I then asked him to explain the purpose of the study in his own words, so as to assess his comprehension of the study's purpose. When it was clear that the participant fully understood the purpose of the study, all questions were adequately answered, and the participant agreed to participate, he was consented over the telephone and asked to sign the consent form (and the authorization form if recruited from a hospital that required it). He was asked to return these forms along with the questionnaires in the pre-stamped addressed envelope. I informed him that he would receive payment based on the amount of time that he took to return those forms from time of phone consent as verified by postmark: \$60 if he sent forms within two weeks of having been consented over the phone, \$35 if he sent them within three weeks, and \$15 if he sent them thereafter. I encouraged the participant to contact me if he had any questions about the questions posed in the questionnaires or had difficulty

understanding some of the questions. The participant was also asked if he wished to be contacted by phone to be reminded of the two-week deadline for receipt of the full \$60 payment two days before the deadline. If he stated that he wished to be contacted, he was contacted as agreed. If he did not wish to be contacted, no reminder phone call was placed. At the end of the phone conversation, the participant was thanked for his time.

Response rates. Participants were recruited in one of four ways: 1) by responding to an advertisement placed in a local newspaper, 2) by responding to flyers posted in a medical clinic from which they sought services, 3) by contacting me after being referred by their mental health provider, 4) by responding to a mailing from their physician.

Eighty-four individuals responded to an advertisement that they had seen in a local newspaper (78 from the L.A. area and six from the Napa Valley area). Out of these 84 individuals, 35 (42%) completed the study and 12 (14%) were deemed ineligible to participate. Out of these 12 individuals, 10 (12%) were deemed ineligible to participate due to being women (despite the fact that inclusion criteria were included in the advertisements) and only two participants were ineligible to participate because they were not of Mexican descent. Overall, 27 (32%) individuals who initially contacted me about the study stated that they were no longer interested in participating in the study (19 individuals or 22.5% expressed lack of interest at the time of the initial phone conversation and eight individuals or 9.5% were no longer interested by the time the consent process was scheduled to take place). Seven (8%) individuals did not return my phone calls. Finally, three (3.5%) individuals provided phone numbers that were disconnected when I attempted to return their call to go over the consent process.

Nineteen participants contacted me after seeing a flyer posted in a medical clinic from which they sought services (the Pain Clinic of Monterey Bay, the Pain Management Center at Stanford University, and primary care clinics that are part of the VA Eastern Colorado Healthcare System). Overall, 11 (58%) individuals who responded to the flyer completed the study, while two (10.5%) individuals were ineligible to participate due to being single, and six (31.5%) individuals indicated that they were not interested in participating or failed to return my phone calls.

Six participants were invited to participate in the study by a health psychologist in private practice. All six participants completed the study.

One hundred and seventy-two recruitment letters were sent to patients (who were screened for eligibility) at the Denver Health Medical Center and the University of Colorado Hospital. Twenty-three (13%) expressed interest in the study, but only 14 (8%) individuals recruited through these two hospitals completed the study, with the remainder expressing no longer being interested in participating in the study or failing to return my phone calls.

Measures

Demographic questionnaire. A demographic form was used to collect information about participants' age, race, marital status, length of marriage/cohabitation relationship, number of children, employment status, occupation, income, education, worker's compensation status, duration of present pain problem, previous surgical and medical treatment for pain, religion, and generational level.

Hispanic generational history was established by asking participants to identify their own birthplace, that of their parents and that of their grandparents, and indicating their generational level (Marín & Marín, 1991).

Pain experience. The West Haven-Yale Multidimensional Pain Inventory (WHYMPI; Kerns, Turk, & Rudy, 1985) is a 52 –item, 13-scale inventory divided into three parts, and designed to assess several aspects of the subjective pain experience. The original version of the WHYMPI was used in the present study (other versions exist as well). The WHYMPI places an emphasis on patient’s appraisals of their pain problems, the impact of pain on their lives, and the responses of others.

Section 1 consists of five scales designed to evaluate the impact of pain on the patients’ lives: Pain Severity; perceived Interference of pain in vocational, social/recreational, and family and marital functioning; perceived Life-Control with regard to activities of daily living and daily problems; Affective Distress, including ratings of depressed mood, irritability, and tension; and appraisal of Support and concern from significant others. The only scale from section 1 that was used in the main analyses was the pain severity scale. The other scales were explored in the exploratory analyses section, given that they have not been as widely used in the spousal responses to pain literature and were thus not necessarily expected to lead to significant findings. In the present study, coefficient alpha for the pain severity scale was .83.

Section 2 is a set of three subscales that assess patients’ perceptions of the range and frequency of responses by significant others to patient demonstrations and complaints of pain. Specifically, the three scales assess the perceived frequencies of Punishing (e.g., “expresses anger at me,” “expresses frustration at me”), Solicitous (e.g.,

“asks me what he/she can do to help,” “gets me some pain medications”), and Distracting (e.g., “encourages me to work on a hobby,” “reads to me”) responses. Items are rated on a 7-point scale anchored by 0 = ‘never’ and 6 = ‘very often.’ The Solicitous and Punishing Responses scale are the two scales from section 2 that are used in this study. In the present study, coefficient alpha for the Solicitous Responses scale was .83 and it was .82 for the Punishing Responses scale.

Section 3 assesses patients’ reports of their participation in five categories of daily activities: Household Chores, Outdoor Work, Activities Away from Home, Social Activities, and General Activity. Patients are asked to indicate how often they engage in each listed activity on a 7-point scale. Section 3 of the WHYMPI was not used in this study.

The WHYMPI subscales have been shown to have good internal consistency, convergent validity, discriminant validity, as well as internal and external construct validity (Kerns et al., 1985). The WHYMPI has been translated into Spanish and has been found to be reliable and valid in that version (Jacob & Kerns, 2001).

Depressive symptomatology. The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) is a revised version of the BDI, a commonly used depression scale. It is comprised of 21 items that are rated on a 0-3 scale. To reduce the likelihood that participants would experience high levels of distress as a result of completing the study questionnaires, the BDI-II item on suicidality was deleted from the inventory, given that completion of this item has sometimes been deemed to be associated with psychological risk. Thus, the BDI-II scale used in this study was comprised of 20 items.

Participants rate symptoms that have occurred in the past 2 weeks. Scores range from 0 to 63 in the original BDI-II and from 0 to 60 in the 20-item version used in the present study. Coefficient alpha estimates of reliability for the BDI-II have been found to be .92 among outpatients and .93 among college students (Beck et al., 1996). In the present study, the coefficient alpha for the 20-item scale was .91. In addition, adequate validity (e.g., content, factorial) has been demonstrated, and diagnostic discrimination has been established (Beck et al., 1996).

The original BDI has been found to have good sensitivity and specificity in identifying depression in patients with chronic pain (Geisser, Roth, & Robinson, 1997; Turner & Romano, 1984). However, the original BDI contains a large number of items concerning somatic disturbances. This is a weakness of the original BDI, given that chronic pain patients have been found to endorse the somatic items, which artificially inflates their overall score (Wesley, Gatchel, Polatin, Kinney, & Mayer, 1991). While only one study has looked at the use of the BDI-II with chronic pain patients, the fact that the coefficient alpha was found to be .92 indicates that this scale demonstrates high internal consistency among chronic pain patients (Poole, Bramwell, & Murphy, 2006). This finding, along with the fact that the most important weaknesses of the original BDI for its use with chronic pain patients were removed from the revised version, justified, in my mind, its use with my sample of Mexican American men with chronic pain.

There is evidence of psychometric adequacy and comparability of the Spanish language version of the BDI-II among a sample of bilingual Hispanic Americans. The coefficient alpha for the Spanish version of the BDI-II has been found to be .94 (Novy, Stanley, Averill, & Daza, 2001).

Relationship satisfaction. The Relationship Satisfaction Questionnaire (RSAT; Burns & Sayers, 1992) consists of 14 items that assess satisfaction in various areas of the relationship (e.g., handling finances and degree of affection and caring). Respondents indicate their degree of satisfaction in each area on a scale from 0 (very dissatisfied) to 6 (very satisfied). One item asks about satisfaction with regard to raising children. Since a large portion of my sample did not have children, this item was deleted for the purpose of my analyses. Total scores with the 13 remaining items are the sum of the items and range from 0 to 78, with higher scores indicating greater satisfaction.

The reliability and validity of the 14-item scale have been found to be adequate (Heyman, Sayers, & Bellack, 1994). Specifically, the scale's internal consistency is very high ($r = .97$). In the present study, the coefficient alpha for the 13-item scale was .93. The RSAT has been found to have a relatively high test-retest correlation at 6 weeks ($r = .72$). The RSAT has good concurrent validity, as attested by its high correlation with the Dyadic Adjustment Scale ($r = .89$ for men, $r = .90$ for women). Factor analysis of the RSAT suggests a single dimension underlying the items (Heyman, et al., 1994). While there are several measures of relationship satisfaction that are more widely used in couples research (e.g., Dyadic Adjustment Scale, Locke-Wallace Marital Adjustment Scale), the RSAT was chosen for this study because it was the only measure of relationship satisfaction that had been translated into Spanish at the start of the present research project. I have no reason to believe that any other relationship satisfaction measures would have been more sensitive or would have resulted in different findings, even for those that examine slightly different constructs (e.g., consensus, cohesion, conflict resolution, communication).

Acculturation. The Acculturation Rating Scale for Mexican Americans-II (ARMSA-II; Cuéllar, Arnold, & Maldonado, 1995) is a scale that has been specifically normed on Mexican Americans. The ARMSA-II consists of two scales. Scale 1 (which includes the Mexican Orientation subscale [MOS] and the Anglo Orientation subscale [AOS]) yields a Mexican orientation score and an Anglo orientation score. Scale 1 consists of 30 items (13 items for AOS and 17 items for MOS) that are answered on a Likert-type scale of *not at all, very little or not very often, moderately, much or very often, and extremely often or almost always*. The MOS mean is subtracted from the AOS mean to obtain a linear acculturation score that represents an individual's score along a continuum from very Mexican oriented to very Anglo oriented. Scale 1 of the ARMSA-II includes items which assess the following four domains: (a) language use and preference, (b) ethnic identity and classification, (c) cultural heritage and ethnic behaviors, and (d) ethnic interaction. Scale 2 of the ARMSA-II is called the Marginalization scale, but was not be used in this study.

Cuéllar, et al. (1995) found the ARMSA-II to have good overall internal consistency (coefficient alphas = .83 and .88 for the AOS and MOS, respectively). They found test-retest Pearson product-moment correlation coefficients to be at .94 and .96 for the AOS and MOS, respectively. In addition, they found that construct validity of the ARMSA-II was supported by a proportional increase in acculturation scores (toward Anglo culture) with successive generation levels. In the present study, the coefficient alphas were .86 and .84 for the AOS and MOS, respectively.

Simpatía. The *simpatía* scale (Griffith, Joe, Chatham, & Simpson, 1998) is a 17-item scale that was designed to examine social attributes reflecting agreeableness, respect

for others, and politeness. These three constructs comprise the three subscales of the *simpatía* scale. The agreeableness subscale addresses issues relating to agreeing with others and similarity of opinions between self and others. The respect subscale addresses issues relating to saying good things about others, trusting others, and treating others with respect. The politeness subscale addresses issues relating to avoiding conflict with others, doing favors, and treating others as equals. The items are answered on a Likert-type scale of *never, rarely, sometimes, often, and always*.

Griffith, et al. (1998) found the *simpatía* scale to have good overall internal consistency (coefficient alpha = .80) and found that the three subscales yielded adequate coefficients alphas (coefficient alpha = .72, .71, and .70 for the agreeableness, respect, and politeness subscales, respectively). With regard to convergent and discriminant validity, they found the *simpatía* scale to be positively related to social support ($r = .49$), social conformity ($r = .39$), and negatively related to hostility ($r = -.44$). In the present study, coefficient alpha was .79 for the full *simpatia* scale and .83, .70, and .54 for the agreeableness, respect, and politeness subscales, respectively, indicating that internal consistency was adequate for the full scale and the agreeableness and respect subscales, but less than desirable for the politeness subscale. An examination of the coefficient alpha that would be obtained if each of the four items that comprise the politeness subscale were removed from the overall politeness subscale indicates that no one item in particular was contributing to the low coefficient alpha for that scale. In addition, an exploratory factor analysis was run to examine the factor structure and determine if any items in the politeness subscale warranted being excluded from the scale. The results of this analysis point to a one-factor solution with the factor accounting for 45% of the

variance. Furthermore, the results indicate that the structure of the scale was adequate with all items falling above the .40 range on the component matrix. An examination of the scree plot, however, suggests that the items may have loaded on two factors. A confirmatory factor analysis that specified two factors was run to examine the suitability of a two-factor solution for the politeness subscale. The results of this analysis indicate that the two extracted factors accounted for 68% of the variance. The two items that were found to load onto one factor included: “Were you polite to others?” (factor loading of .77) and “Did you do favors for others?” (factor loading of .88). The item “Did you try to avoid conflicts with others?” fell at the .40 cutoff, while the other item fell below the .40 cutoff. However, these two items loaded highly on a different factor. Specifically, “Did you treat others as your equal?” had a factor loading of .92 and “Did you try to avoid conflicts with others?” had a factor loading of .52. Due to the presence of two factors for the politeness subscale with no items failing to adequately load on either factor, the four items of the scale were used in the analyses. However, it should be noted that, given my small sample size and resulting limited power, it is possible that the results of the factor analysis were not accurate. Future research with larger sample sizes would be better suited to verify the factor structure of the scale. Nevertheless, it is likely that the shortness of the politeness scale contributed to less variability in the scale, thus impacting the coefficient alphas.

This scale is the only scale I found that measured the construct of *simpatía* (I was not able to locate the *simpatía* measure used by Triandis, et al., 1986). This scale, however, has the weakness that it was validated on a group of substance abusers. In addition, in the sample on which it was validated, the scale was found not to be

significantly related to the construct of acculturation. The authors speculate that this lack of significant relationship between *simpatía* and acculturation may stem from the fact that the *simpatía* scale was validated on a sample of Hispanic individuals that were less acculturated than those that comprised the sample used to validate the acculturation scale with which the construct of *simpatía* was compared.

Results

Data Preparation

An examination of histograms for the variables of interest (pain severity, depressive symptomatology, perceived punishing responses, perceived solicitous responses, relationship satisfaction, *simpatia*, acculturation, and generational status) indicated that two of the variables exhibited skewness. These two variables were recoded so as to minimize problems associated with skewed variables. Specifically, the generational status variable displayed some positive skewness. I recoded this variable in a way that makes theoretical sense, namely by keeping all 1st generation participants as a 1, keeping 2nd generation participants as a 2, and recoding all others as a 3. Indeed, there is likely little difference between a 3rd generation, a 4th generation, and a 5th generation U.S. resident. Thus, five cases with a value of 5 were recoded as a 3. The second variable that exhibited skewness was perceived solicitous responses. The original variable ranged in value from 0 to 6 and was recoded so that all values between 0 and 1.99 were recoded as a 2 (a total of five cases met this criteria) and all values between 2 and 3.99 were recoded as a 3 (a total of 19 cases met this criteria). Thus, the perceived solicitous responses variable was recoded to contain values of 2, 3, 4, 5, and 6. Further examination of the skewness of these variables through SPSS confirmed that the variable of generational status met criteria for significant skew. The variable of perceived solicitous responses, while not meeting criteria for significant skew, approached significance and was therefore left in its recoded form. Table 3, which presents

descriptive statistics for the variables of interest, including changes in descriptive statistics after the recoding, indicates that the recoding resulted in adequately decreasing the skewness of the generational status and perceived solicitous responses variables. The regression analyses tested in hypotheses 4 through 6 were re-examined with the non-recoded versions of the variables to see how recoding might have changed the results. The results remained unchanged when the non-recoded variables were used instead of the recoded variables.

To determine if there were any extreme cases, I examined scatterplots and looked to see whether any of the variables met criteria for being outliers based on using Allison's criteria of ± 2 for studentized residuals for each regression analysis. For each regression analysis, between three and five cases met criteria for being outliers. Given my small sample size and the resulting difficulties in detecting a medium effect size, I decided not to drop any cases from my analyses.

Using Allison's cut-off score of $< .40$ for tolerance, I found that no variables exhibited problems of multicollinearity with the dependent variables examined in the regression analyses, namely relationship satisfaction, pain severity and depressive symptomatology.

Tests of Hypotheses

Data analytic plan. Hypotheses 1 and 2 examined correlations among cultural indicators and demographic variables. For hypotheses 3 and 4, I used hierarchical regression analyses. Hypotheses 3 and 4 were meant to test the underlying assumption on which hypothesis 5 and 6 rested, namely that perceived partner responses (both solicitous partner responses and punishing partner responses) and the cultural indicators (*simpatia*,

acculturation, and generational status) would interact and that this interaction would be a significant predictor of relationship satisfaction. Hypotheses 3 and 4 were tested by conducting the following hierarchical regression analyses, using the SPSS STEPWISE function: Relationship Satisfaction = $b_0 + b_1$ (Perceived Partner Responses: either Punishing or Solicitous) + b_2 (Cultural Indicator: *Simpatia*, Acculturation, or Generational Status) + b_3 (Cultural Indicator x Perceived Partner Responses), with the main effects of perceived partner responses and the cultural indicator entered into the model first and the two-way interactions entered second. For these analyses, a median split was performed on the three cultural indicators and the resulting two groups were then dummy coded. Thus, low *simpatia* was assigned a score of 0 and high *simpatia* was assigned a score of 1. Similarly, low acculturation was assigned a score of 0 and high acculturation was assigned a score of 1, and low generational status was assigned a score of 0 and high generational status was assigned a score of 1. I then ran different regression models for each cultural indicator, with each cultural indicator dummy coded.

Since I was most interested in looking at what variables would impact pain severity and depressive symptomatology, my main set of hypotheses (hypotheses 5 and 6) were those that looked at how the cultural indicators, the perceived partner responses variables, and relationship satisfaction impacted the dependent variables of pain severity and depressive symptomatology. Several hierarchical regression analyses were conducted to assess the effects of the perceived partner responses variables (punishing responses or solicitous responses), relationship satisfaction, one of three cultural indicators (*simpatia*, acculturation, or generational status), the two-way interactions of Partner Responses x Relationship Satisfaction, Cultural Indicator x Relationship Satisfaction, Cultural

Indicator x Partner Responses, and the three-way interactions of Partner Responses x Relationship Satisfaction x Cultural Indicator on pain severity and depressive symptomatology. These too were conducted using the SPSS STEPWISE function. The three main effects were entered into the model first, with both two-way interactions entered next, and the three-way interaction entered last. Thus, there were six sets of analyses: 1) one examined the effects of the variables, including *simpatia*, on pain severity, 2) the second examined the effects of these variables on depressive symptomatology, 3) the third examined the effects of the variables, including acculturation as a substitute for *simpatia*, on pain severity, 4) the fourth examined the effects of these variables, including acculturation as a substitute for *simpatia*, on depressive symptomatology, 5) the fifth examined the effects of the variables, including generational status, on pain severity, 6) and finally, the sixth set of analyses examined the effects of these variables, including generational status, on depressive symptomatology. This set of six analyses examined the incremental contribution of the cultural indicators (*simpatia*, acculturation, and generational Status). Hypotheses 5 and 6 would be supported if the entry of the cultural indicators added a significant amount of variance in pain severity and depressive symptomatology over and above that accounted for by relationship satisfaction and either one of the partner responses variable, and if the cultural indicators interacted with those variables in a way that went along with my different hypotheses for Mexican American individuals low and high in *simpatia*, acculturation, and generational status. Therefore, it was expected that there would be significant Cultural Indicator x Perceived Partner Responses x Relationship Satisfaction interactions for pain severity and depressive symptomatology.

Sample size and power. Based on my obtained sample size and effect sizes, several models were tested post-hoc. Power was calculated using G-Power 3.0 and was tested with α set at $p < .05$. One model used three independent variables (punishing partner responses + one of three cultural indicators + interaction of punishing partner responses with cultural indicator). The effect sizes obtained from these analyses were small in size and fell in the .073 to .075 range, depending on which cultural indicator was included in the analyses. The power achieved ranged from 39 to 40%. To detect these small effect sizes in the 0.073 to 0.075 range while achieving power of .80, the sample size would have had to range from 139 to 143, depending on the particular cultural indicator included in the analysis. To detect a medium effect size ($f^2 = .15$) (the size that includes most findings from the pain literature), while achieving power of .80, a sample size of 77 would have been required to detect a significant model. To detect a large effect size ($f^2 = .35$), while achieving power of .80, a sample size of 36 would have sufficed to detect a significant model.

A different model used three independent variables (solicitous partner responses + one of three cultural indicators + interaction of solicitous partner responses with cultural indicator). The effect sizes obtained from these analyses were also small in size and fell in the 0.049 to 0.0604 range, depending on which cultural indicator was included in the analyses, and the power achieved ranged from 25 to 30%. To detect these small effect sizes in the 0.049 to 0.0604 range while achieving power of .80, the sample size would have had to range from 185 to 226, depending on the particular analysis. To detect a medium effect size ($f^2 = .15$), while achieving power of .80, a sample size of 77 would have been required to detect a significant model. To detect a large effect size ($f^2 = .35$),

while achieving power of .80, a sample size of 36 would have sufficed to detect a significant model.

A second set of regression analyses with the dependent variable of pain severity included seven independent variables (punishing partner responses + relationship satisfaction + one of three cultural indicators + interaction of punishing partner responses with relationship satisfaction + interaction of cultural indicator with relationship satisfaction + interaction of cultural indicator with punishing partner responses + interaction of cultural indicator/relationship satisfaction/punishing partner responses). The effect sizes obtained from these analyses were large in size and fell in the 0.35 to .47 range, depending on which cultural variable was included in the analyses. The power achieved ranged from 90 to 97% and sample sizes ranging from 39 to 45 would have been adequate in detecting these large effect sizes.

Another set of regression analyses with the dependent variable of depressive symptomatology included seven independent variables (punishing partner responses + relationship satisfaction + one of three cultural indicators + interaction of punishing partner responses with relationship satisfaction + interaction of cultural indicator with relationship satisfaction + interaction of cultural indicator with punishing partner responses + interaction of cultural indicator/relationship satisfaction/punishing partner responses). The effect sizes obtained from these analyses were large in size and fell in the 0.57 to .63 range, depending on which cultural variable was included in the analyses. The power achieved was 100% for the three analyses and sample sizes ranging from 17 to 20 would have been adequate in detecting these large effect sizes. It should be noted,

however, that these power analyses do not distinguish between detection of main effects and interactions, even though interactions are harder to detect.²

My sample size was smaller than that optimally required to detect medium effect sizes for the regression analyses involving three predictors; thus, the results of the regression analyses should be interpreted with caution. Given my limited sample size, in the case of the regression analyses and selected correlation analyses, in addition to reporting findings that were significant at the .05 and .01 levels, I also reported findings between .05 and .10 as trends.

Hypothesis 1

I first examined whether all three cultural measures (acculturation, *simpatia*, and generational status) were significantly correlated with each other and whether they were significantly correlated with family income. These particular correlations analyses were conducted through one-tailed tests, given that a specific direction of association was hypothesized. Other correlations between the variables of interest and demographic

² Several models were tested a priori using three independent variables (partner responses + cultural indicator + interaction of partner responses/cultural indicator). Power was calculated using G-Power 3.0 and was tested with α set at $p < .05$. With a sample of 62 and a medium effect size ($f^2 = .15$), 69% power was achieved (power = .6946) ($F(3, 58) = 2.76$). To achieve power of .80 and a medium effect size ($f^2 = .15$), a priori power analyses indicated that a sample size of 77 would have been required to detect a significant model ($F(3, 73) = 2.73$). The second set of regression analyses conducted included seven independent variables (partner responses + relationship satisfaction + cultural indicator + interaction of partner responses/relationship satisfaction + interaction of cultural indicator/relationship satisfaction + interaction of partner responses/cultural indicator + interaction of partner responses/cultural indicator/relationship satisfaction). The α for the test of these models were set at .05. With a sample of 62 and a medium effect size ($f^2 = .15$), 51% power was achieved (power = .5137) ($F(7, 54) = 2.18$). To achieve power of .80 and a medium effect size ($f^2 = .15$), a priori power analyses indicated that a sample size of 103 would have been required to detect a significant model ($F(7, 95) = 2.10$).

variables were examined through two-tailed tests, because no specific direction of association was predicted.

The Pearson correlation coefficients of the three cultural variables with demographic variables and variables of interest for later analyses are presented in Table 4. The sample sizes ranged from 60 to 62.

In support of hypothesis 1, the correlation analyses revealed that acculturation and *simpatia* were negatively and significantly correlated with each other ($r = -.29, p < .05$), indicating that more acculturated individuals were less likely to adhere to the cultural script of *simpatia*. Further, correlation analyses revealed that acculturation and generational status were positively and significantly correlated with each other ($r = .80, p < .01$), indicating that more acculturated individuals were more likely to have been in the U.S. for multiple generations. In addition, generational status and *simpatia* were found to be negatively and significantly correlated ($r = -.22, p < .05$), indicating that individuals that adhered more highly to the cultural script of *simpatia* were less likely to have been in the U.S. for multiple generations. Of the three cultural measures, only acculturation and generational status were found to be significantly correlated with family income (acculturation: $r = .25, p < .05$; generational status: $r = .24, p < .05$), indicating that those with higher family incomes were more likely to be more highly acculturated and to have been in the U.S. for multiple generations. The above correlations were all in support of hypothesis 1. However, contrary to my hypothesis, *simpatia* did not demonstrate a significant association with family income ($r = .026, p = .42$).

In addition, there were several significant associations involving the three cultural indicators and other variables of interest that I had not originally predicted to be

significant (and that were, therefore, tested through two-tailed tests). Thus, I found that pain severity was positively and significantly correlated with acculturation ($r = .30, p < .05$) and generational status ($r = .38, p < .01$). Further, I found that *simpatia* was negatively correlated with depressive symptomatology ($r = -0.12, p < .01$) and positively correlated with relationship satisfaction ($r = .31, p < .01$). These findings indicate that those who were more acculturated and had been in the U.S. for a greater number of generations experienced higher levels of pain severity than those who were less acculturated and had been in the U.S. for fewer generations, and that those who adhered to the cultural script of *simpatia* to a lesser degree tended to experience more depressive symptomatology and to be more dissatisfied in their relationship with their partner. Thus, interestingly, the more acculturated men in my sample appear to have had more difficulties than the less acculturated men in several areas of their lives.

Furthermore, several associations that I had not anticipated that involved family income were found to be significant (these associations were tested through two-tailed tests). Thus, family income was negatively and significantly associated with pain severity ($r = -.31, p < .01$), depressive symptomatology ($r = -.36, p < .01$), and age ($r = -.24, p < .05$), and positively and significantly associated with relationship satisfaction ($r = .35, p < .01$), indicating that those with higher family incomes experienced less pain, were less depressed, tended to be younger, and were more satisfied with their relationship with their partner.

Hypothesis 2

In the second hypothesis, I examined the correlations between perceived partner responses (punishing responses and solicitous responses), pain severity, depressive

symptomatology, and relationship satisfaction. Specifically, I hypothesized that perceived punishing responses would be positively correlated with pain severity and depressive symptomatology, but negatively correlated with relationship satisfaction, while perceived solicitous responses would be negatively correlated with pain severity and depressive symptomatology, but positively correlated with relationship satisfaction. Perceived punishing responses and perceived solicitous responses were expected to be negatively correlated with one another, while pain severity and depressive symptomatology were expected to be positively correlated with one another. Relationship satisfaction was expected to be negatively correlated with pain severity and depressive symptomatology. These particular correlations analyses were conducted through one-tailed tests, given that a specific direction of association was hypothesized. Other correlations between the variables and demographic variables were examined through two-tailed tests, because no specific direction of association was predicted.

In the case of punishing responses, as expected, this variable was found to be significantly and positively correlated with both pain severity ($r = .39, p < .01$) and depressive symptomatology ($r = .43, p < .01$) and significantly and negatively correlated with relationship satisfaction ($r = -.30, p < .05$), indicating that higher levels of punishing responses were associated with higher levels of pain severity and depressive symptomatology, and lower levels of relationship satisfaction. As for solicitous responses, this variable did not show a significant association with pain severity ($r = -.044, p = .37$), nor did it show a significant association with depressive symptomatology ($r = -.17, p = .10$), or with relationship satisfaction ($r = .18, p = .08$), findings that run contrary to my hypotheses. There was, however, a non-significant trend for solicitous

responses to be negatively associated with depressive symptomatology and positively associated with relationship satisfaction. In support of hypothesis 2, the correlation between punishing responses and solicitous responses indicates that these variables were significantly and negatively correlated with one other ($r = -.32, p < .01$), while the correlation between pain severity and depressive symptomatology indicates that these variables were positively correlated with one another ($r = .56, p < .01$). As expected, relationship satisfaction was found to be negatively correlated with pain severity ($r = -.49, p < .01$) and with depressive symptomatology ($r = -.73, p < .01$), indicating that individuals who were experiencing higher levels of pain and depression were less satisfied with their relationship with their partner. While age was not expected to be significantly correlated with any of the variables of interest in the study, this variable was found to be significantly correlated with several variables. Indeed, age was found to be positively correlated with generational status, ($r = .28, p < .05$), pain severity ($r = .36, p < .01$), depressive symptomatology ($r = .28, p < .05$), and negatively correlated with solicitous responses ($r = -.26, p < .05$), and relationship satisfaction ($r = -.37, p < .01$). Thus, participants in my sample who were older were more likely to have been in the U.S. for multiple generations, to have higher levels of pain severity and depression, to experience less solicitous responses from their partner, and to be less satisfied with their relationship, in comparison to younger participants.

Hypothesis 3

The third hypothesis was that the interaction of perceived punishing responses by each of the cultural indicators (*simpatia*, acculturation, and generational status) would be a significant predictor of relationship satisfaction. Thus, it was expected that when

perceived punishing responses were low, the groups that were high in *simpatia*, less acculturated, and that were first generation U.S. residents would have higher relationship satisfaction than the groups that were low in *simpatia*, more acculturated, and had been U.S. residents for a greater number generations.

When punishing responses, *simpatia*, and the interaction between *simpatia* and punishing responses were entered into the model using a hierarchical regression (with the main effects of punishing responses and *simpatia* entered into the model first), I found that the model had some validity in terms of explaining relationship satisfaction, $F(1, 58) = 5.65, p < .05$; however, the model only explained 7.3% of the variance ($f^2 = .079$). Further, only the punishing responses variable was found to be significantly associated with relationship satisfaction, $t(59) = -2.38, p < .05$, indicating that higher levels of punishing responses were associated with lower levels of relationship satisfaction. There was also a non-significant trend for individuals higher in *simpatia* to be higher in relationship satisfaction, $t(59) = 1.77, p = .082$. These results echo the results of the correlation-based analyses (see presentation of t -scores and β weights in Table 5).

When the cultural indicator of acculturation was entered into the model as a substitute for *simpatia*, the model demonstrated some validity in terms of explaining relationship satisfaction $F(1, 59) = 5.89, p < .05$, but only 7.5% of the variance was explained by the model ($f^2 = .081$). In this analysis, once again, only the punishing responses variable was found to be significantly associated with relationship satisfaction, $t(60) = -2.43, p < .05$.

When generational status was the cultural indicator that was entered into the model, I found that, once again, the model had some validity in terms of explaining

relationship satisfaction $F(1, 59) = 5.89, p < .05$, but only 7.5% of the variance was explained by the model ($f^2 = .081$). As with the analyses for the other two cultural indicators, only the punishing responses variable was significantly associated with relationship satisfaction, $t(60) = -2.43, p < .05$.

In summary, while the models for the three cultural indicators had some validity in terms of explaining relationship satisfaction, the amount of variance explained by each model was low. In addition, contrary to my predictions, the interactions between the cultural indicators and punishing responses were not significant. The only variable that was significantly associated with relationship satisfaction, regardless of what specific cultural indicator was entered into the model, was punishing responses.

Hypothesis 4

The fourth hypothesis was that the interaction of perceived solicitous responses by each of the cultural indicators (*simpatia*, acculturation, and generational status) would be a significant predictor of relationship satisfaction. These results were hypothesized to be weaker than the perceived punishing responses-based results, given that negative interactions between partners more powerfully affect relationships than do positive interactions. Thus, it was expected that when perceived solicitous responses were high, the groups that were high in *simpatia*, less acculturated, and that were first generation U.S. residents would have higher relationship satisfaction than the groups that were low in *simpatia*, more acculturated, and had been U.S. residents for a greater number of generations.

When solicitous responses, *simpatia*, and the interaction between *simpatia* and solicitous responses were entered into the model using a hierarchical regression, the

model was found to have some validity in terms of explaining relationship satisfaction, $F(1, 58) = 4.55, p < .05$; however, the model explained even less variance than the model that tested the punishing responses-based hypotheses. Indeed, this model explained only 5.7% of the variance ($f^2 = .0604$). In this model, there were no significant main effects. However, the interaction between *simpatia* and solicitous responses was significantly associated with relationship satisfaction, $t(59) = 2.13, p < .05$, with the interaction indicating, as predicted, that for the group that was high in *simpatia*, a high level of perceived solicitous responses from their partner was associated with high levels of relationship satisfaction, while low levels of perceived solicitous responses was associated with low levels of relationship satisfaction. Conversely, for the group that was low in *simpatia*, high levels of perceived solicitous responses from their partner was found to be associated with low levels of relationship satisfaction, while low levels of perceived solicitous responses was associated with high levels of relationship satisfaction (see Figure 1). Given the fact that this finding, while significant, was not strong, it should be interpreted with caution (see presentation of t -scores and β weights in Table 6).

When the cultural indicator of acculturation was entered into the analyses as a substitute for *simpatia*, the hierarchical regression analyses (conducted using the SPSS STEPWISE function) did not generate any output in SPSS. An examination of the data indicated that there were many similarities between the scores on the acculturation variable and the two-way interaction between acculturation and solicitous responses, pointing to a lack of variability in the model. According to Judd and McClelland (1989), the use of stepwise methods may not produce the most appropriate model if there are redundant predictors. Thus, a multiple regression was tried next. The results of this

analysis indicated that there was a significant multicollinearity problem between acculturation and the interaction between acculturation and solicitous responses, with tolerance scores of .08 for both measures, scores that are significantly lower than Allison's cut-off score of $< .40$. This multicollinearity problem may also have interfered with the ability to conduct a hierarchical regression, even though the main problem was lack of variability in the model. To address the multicollinearity issue, the problematic variables were centered and a multiple regression was run once again with the centered variables. Centering the variables did not remedy the multicollinearity issue, with tolerance scores for acculturation and the interaction between acculturation and solicitous responses continuing to be .08. The analyses failed to produce any significant results, but the issues with multicollinearity should be kept in mind when interpreting these non-significant results. The analyses were also conducted with the untransformed version of the solicitous responses variable. The hierarchical regression analyses once again did not generate any output in SPSS, indicating that the transformation of the solicitous responses variable was not the source of the problem. In this case, the multicollinearity problem could be due to low variability of the acculturation measure (see presentation of range and standard deviation in Table 3).

Similarly to the issues that arose for the model that included the cultural indicator of acculturation, when the cultural indicator of generational status was entered into the analyses in lieu of acculturation or *simpatia*, the hierarchical regression analyses did not generate any output in SPSS. As was the case for the previous model, an examination of the data indicated that there were many similarities between generational status and the two-way interaction between generational status and solicitous responses, pointing to a

lack of variability in the model. In this case as well, a multiple regression was tried next. The same problems that emerged in the previous model emerged in this model as well, with the results of the multiple regression indicating that there was a significant multicollinearity problem between generational status and the interaction between generational status and solicitous responses, with tolerance scores of .09 for both measures. Once again, even after attempting to address the multicollinearity issue by centering the problematic variables, the tolerance scores for generational status and the interaction between generational status and solicitous responses remained at .09, and the analyses failed to produce any significant results in this case as well.

In summary, while the models that included the cultural indicator of *simpatia* had some validity in terms of explaining relationship satisfaction, the amount of variance explained by the model was low. In addition, the interactions between *simpatia* and solicitous responses was significantly associated with relationship satisfaction; however, this finding was not strong in terms of effect size. Furthermore, the hierarchical regressions that included the cultural indicators of acculturation and generational status did not generate any output in SPSS. These analyses were ran once again using multiple regressions. However, the results of these analyses indicated that there was a significant multicollinearity problem between the cultural indicator (acculturation and generational status) and the interaction between the cultural indicator and solicitous responses, with centering of the variables not remedying the multicollinearity issues. Given the failure to find an effect of solicitous responses on relationship satisfaction when acculturation and generational status were entered into the model, findings that should have formed the

basis for hypothesis 6, hypothesis 6 with these two cultural indicators was not tested.

Hypothesis 5

The fifth hypothesis was that the three cultural indicators (*simpatia*, acculturation, and generational status) would significantly interact with perceived punishing responses and relationship satisfaction to impact depressive symptomatology and pain severity among Mexican Americans at varying levels of each cultural indicator differently.

The results of the regression analyses indicated that, in the model that examined the effect of punishing responses, relationship satisfaction, and *simpatia* on pain severity, 26% of the variability in pain severity was explained by the model ($f^2 = .35$). The model reached significance, $F(2, 57) = 11.35, p < .001$. While neither the three-way interaction between punishing responses, relationship satisfaction, and *simpatia* and none of the two-way interactions were significant, the main effect of relationship satisfaction was significant once one partialled out the effects of the other variables, $t(59) = -3.27, p < .01$, as was the main effect of punishing responses, $t(59) = 2.34, p < .05$. Thus, just as I found with the correlation analyses, the results of the regression analyses indicate that lower levels of relationship satisfaction and higher levels of perceived punishing responses from one's partner were associated with higher levels of pain severity. However, none of the hypothesized interactions between *simpatia*, punishing responses, and relationship satisfaction were found to be significantly associated with pain severity (see presentation of *t*-scores and β weights in Table 7).

When I looked at the dependent variable of depressive symptomatology with *simpatia* being entered into the model as the cultural indicator, 63% of the variability in depressive symptomatology was explained by the model, $F(3, 56) = 34.087, p < .001 (f^2$

= 1.702). While neither the three-way interaction nor the two-way interactions were significantly associated with depressive symptomatology, findings that run contrary to my hypotheses, the three main effects were significantly associated with depressive symptomatology, once again echoing the findings from the correlation analyses. Specifically, the main effect of relationship satisfaction was significant, $t(59) = -6.51, p < .001$, indicating that lower levels of relationship satisfaction were associated with increased levels of depressive symptomatology. The main effect of punishing responses was found to be significant, $t(59) = 2.78, p < .01$ and indicates that higher levels of perceived punishing responses to pain behaviors from one's partner were associated with higher levels of depressive symptomatology. Finally, despite this not being initially predicted, the main effect of *simpatia* was found to be significant, $t(59) = -3.37, p < .01$, indicating that lower levels of adherence to the cultural script of *simpatia* were associated with increased levels of depressive symptomatology. Contrary to my prediction, the cultural indicator of *simpatia* was not found to act as a moderator for any of these findings.

When I examined the model that includes punishing responses, relationship satisfaction, and the cultural indicator of acculturation on pain severity, the results of the regression analyses indicate that 28% of the variability in pain severity was explained by the model ($f^2 = .39$). The model reached significance, $F(2, 58) = 12.44, p < .001$. Once again, neither the three-way interaction between punishing responses, relationship satisfaction, and acculturation, nor the two-way interactions were significant. However, I found that the main effect of relationship satisfaction was significant once one partialled out the effects of the other variables, $t(60) = -3.53, p < .01$, as was the main effect of

punishing responses, $t(60) = 2.30, p < .05$. This regression analysis, similarly to the one that included the cultural indicator of *simpatia*, indicates that lower levels of relationship satisfaction and higher levels of perceived punishing responses from one's partner were associated with higher levels of pain severity.

When I looked at the dependent variable of depressive symptomatology with acculturation being entered into the model as the cultural indicator in lieu of *simpatia*, I found that 57% of the variability in depressive symptomatology was explained by the model, $F(2, 58) = 40.68, p < .001 (f^2 = 1.33)$. The three-way interaction, the two-way interactions, and the main effect of acculturation were not found to be significantly associated with depressive symptomatology. However, the main effect of relationship satisfaction was found to be significantly associated with depressive symptomatology, once one partialled out the effects of the other variables, $t(60) = -7.42, p < .001$, indicating that lower levels of relationship satisfaction were associated with increased levels of depressive symptomatology, as was the main effect of punishing responses, $t(60) = 2.65, p < .05$, indicating that higher levels of perceived punishing responses to pain behaviors from one's partner were associated with higher levels of depressive symptomatology. Once again, these findings parallel the correlation-based findings and, as was the case with the cultural indicator of *simpatia*, these regression analyses indicate that the cultural indicator of acculturation did not act as a moderator for any of the findings, even though such a moderating effect of acculturation had been predicted.

When I examined the model that includes punishing responses, relationship satisfaction, and the cultural indicator of generational status on pain severity, the results of the regression analyses indicate that 32% of the variability in pain severity was

explained by the model ($f^2 = .47$). The model reached significance, $F(3, 57) = 10.31, p < .001$. Neither the three-way interaction between punishing responses, relationship satisfaction, and generational status, nor the two-way interactions were significantly associated with pain severity. However, once again, the main effect of relationship satisfaction was significant, once one partialled out the effects of the other variables, $t(60) = -3.31, p < .01$, as were the main effects of punishing responses, $t(60) = 2.01, p < .05$, and generational status, $t(60) = 2.12, p < .05$. This regression analysis indicates that lower levels of relationship satisfaction, higher levels of perceived punishing responses from one's partner, and having been in the U.S. for a greater number of generations were all associated with higher levels of pain severity, findings that once again echo the correlation-based findings.

When I looked at the dependent variable of depressive symptomatology with generational status being entered into the model as the cultural indicator, 57% of the variability in depressive symptomatology was explained by the model, $F(2, 58) = 40.68, p < .001 (f^2 = 1.33)$. The three-way interaction, the two-way interactions and the main effect of generational status were found not to be significantly associated with depressive symptomatology. However, the main effect of relationship satisfaction was found to be significant once one partialled out the effects of the other variables, $t(60) = -7.42, p < .001$, indicating that lower levels of relationship satisfaction were associated with increased levels of depression, as was the main effect of punishing responses, $t(60) = 2.65, p < .05$, indicating that higher levels of perceived punishing responses to pain behaviors from one's partner were associated with higher levels of depression. As with

the two other cultural indicators, the variable of generational status was not found to act as a moderator for any of these findings.

In summary, while I had hypothesized that the cultural indicators of *simpatia*, acculturation, and generational status would significantly interact with perceived punishing responses and relationship satisfaction to impact depressive symptomatology and pain severity among Mexican Americans at varying levels of each cultural indicator differently, the results of the regression analyses failed to show a significant moderating effect for any of the three cultural indicators. The results merely revealed several significant main effects, which paralleled the findings that I found when I conducted my correlation analyses.

Hypothesis 6

The sixth hypothesis was that the three cultural indicators (*simpatia*, acculturation, and generational status) would significantly interact with perceived solicitous responses and relationship satisfaction to impact depressive symptomatology and pain severity among Mexican Americans at varying levels of each cultural indicator differently.

The results of the regression analyses indicate that, in the model that examined the effect of solicitous responses, relationship satisfaction, and *simpatia* on pain severity, 20% of the variability in pain severity was explained by the model ($f^2 = .25$). The model reached significance, $F(1, 58) = 16.01, p < .001$. While neither the three-way interaction between solicitous responses, relationship satisfaction, and *simpatia* and none of the two-way interactions were significant, the main effect of relationship satisfaction was significant once one partialled out the effects of the other variables, $t(59) = -4.00, p <$

.001. Thus, just as I had found with the correlation analyses, the results of the regression analyses indicate that lower levels of relationship satisfaction were associated with higher levels of pain severity. However, the hypothesized interaction between *simpatia*, solicitous responses, and relationship satisfaction was not found to be significantly associated with pain severity (see presentation of *t*-scores and β weights in Table 8).

When I looked at the dependent variable of depressive symptomatology with *simpatia* being entered into the model as the cultural indicator, 58% of the variability in depressive symptomatology was explained by the model, $F(2, 57) = 34.087, p < .001 (f^2 = 1.38)$. While neither the three-way interaction nor the two-way interactions were significantly associated with depressive symptomatology, findings that run contrary to my hypotheses, the three main effects were significantly associated with depressive symptomatology, once again echoing the findings from the correlation analyses. Specifically, the main effect of relationship satisfaction was significant, $t(59) = -7.17, p < .001$ and indicates that lower levels of relationship satisfaction were associated with increased levels of depressive symptomatology. Despite this not being initially predicted, the main effect of *simpatia* was found to be significant, $t(59) = -3.26, p < .05$, indicating that lower levels of adherence to the cultural script of *simpatia* were associated with increased levels of depressive symptomatology.

As discussed above, since I failed to find an effect of solicitous responses on relationship satisfaction when acculturation and generational status were entered into the model, findings that should have formed the basis for hypothesis 6, hypothesis 6 with these two cultural indicators was not tested.

Exploratory Analyses

The following section presents analyses that were not initially hypothesized in the current research.

Examination of additional WHYMPI scales: correlation analyses. There were several WHYMPI scales that were not included in my main analyses because they are not as widely examined as outcome variables in pain research as are pain severity and depression. However, I thought that it would be interesting to examine these variables in terms of how they correlated with each other, with certain demographic variables, and with the variables examined in my main analyses. The additional WHYMPI scales included in these correlation analyses were the following: life control (perceived life-control with regard to activities of daily living and daily problems), interference (perceived interference of pain in vocational, social/recreational, and family and marital functioning), affective distress (ratings of depressed mood, irritability, and tension), and support (appraisal of support received from significant other). The Pearson correlation coefficients of the demographic variables, variables included in the main analyses, and the additional WHYMPI scales are presented in Table 9. The sample sizes ranged from 60 to 62. I predicted that interference and affective distress would be negatively correlated with each other and would both individually be positively correlated with pain severity, depressive symptomatology, punishing responses, and be negatively correlated with relationship satisfaction and life control. Furthermore, I predicted that life control would be negatively correlated with pain severity, depression, punishing responses, interference, and affective distress, and be positively correlated with relationship satisfaction. In addition, I predicted that support would be positively correlated with

solicitous responses and relationship satisfaction. These correlation analyses were all tested through one-tailed tests. I did not make any predictions with regard to specific associations involving the cultural indicators, age, or income, nor did I make any predictions about the direction of association between solicitous responses and the following variables: interference, affective distress, and life control. Thus, these correlations were examined through two-tailed tests.

In support of my hypotheses, I found that individuals who experienced higher levels of interference from the pain in their life were more likely to experience higher levels of affective distress ($r = .49, p < .01$), less likely to feel in control of their life ($r = -.45, p < .01$), tended to experience more pain ($r = .77, p < .01$) and higher levels of depressive symptomatology ($r = .59, p < .01$), tended to perceive their partner to be more punishing of their pain behaviors ($r = .44, p < .01$), and were less satisfied with their relationship with their partner ($r = -.57, p < .01$) than those who experienced lower levels of interference from the pain. Similarly, I found that individuals who experienced higher levels of affective distress were less likely to feel in control of their life ($r = -.57, p < .01$), tended to experience more pain ($r = .45, p < .01$) and higher levels of depressive symptomatology ($r = .48, p < .01$), tended to perceive their partner to be more punishing of their pain behaviors ($r = .38, p < .01$), and were less satisfied with their relationship with their partner ($r = -.43, p < .01$) than those who experienced lower levels of affective distress. Furthermore, those who experienced high levels of life control were more likely to experience lower levels of pain severity ($r = -.50, p < .01$), lower levels of depressive symptomatology ($r = -.68, p < .01$), higher levels of relationship satisfaction ($r = .61, p < .01$), and perceive their partner to be less punishing of their pain behaviors ($r = -.35, p <$

.01), than those individuals who experienced lower levels of life control. Also in support of my hypotheses, I found that those who received more support were more satisfied with their relationship with their partner ($r = .31, p < .05$) and were more likely to perceive their partner to respond solicitously to their pain behaviors ($r = .58, p < .01$) than those who received less support. Finally, as predicted, those who perceived their partners to respond more solicitously also perceived their partners to respond in ways that distracted them from their pain ($r = .64, p < .01$).

In addition, there were several significant associations among life control, affective distress, interference, distracting responses, and the other variables of interest that I had not originally predicted to be significant (and that were, therefore, tested through two-tailed tests). Thus, I found that those who experienced higher levels of interference from the pain in their life were also more likely to be more acculturated ($r = .28, p < .05$), to have been in the U.S. for multiple generations ($r = .40, p < .01$), to be older ($r = .49, p < .01$), and to have less family income ($r = -.34, p < .01$) than those who experienced lower levels of interference from the pain. I also found that those who experienced higher levels of life control tended to be less acculturated ($r = -.25, p < .05$), were more likely to adhere to the cultural script of *simpatia* ($r = .37, p < .05$), tended to have been in the U.S. for fewer generations ($r = -.27, p < .05$), perceived their partner to be more solicitous ($r = .28, p < .05$), and had a higher family income ($r = .36, p < .01$) than those who experienced lower levels of life control. In addition, I found that those who experienced higher levels of affective distress had a lower family income than those who experienced lower levels of affective distress ($r = -.38, p < .01$). Finally, those who perceived their partner to respond to them in ways that distracted them from their pain

reported receiving higher levels of support than those who did not perceive their partner to provide them with distractions ($r = .55, p < .01$).

Life Control, interference, and affective distress as dependent variables. In addition to the analyses presented above that examined pain severity and depressive symptomatology as dependent variables, I wanted to examine two additional variables as dependent variables, namely life control and interference. Given that not many significant associations were found with the perceived solicitous responses and that the results of the regression analyses examining pain severity and depressive symptomatology as outcome variables did not result in many significant findings when the perceived solicitous responses variable was included in the analyses, only the perceived punishing responses variable was examined in these analyses. My hypothesis was that the three cultural indicators (*simpatia*, acculturation, and generational status) would significantly interact with perceived punishing responses and relationship satisfaction to impact life control and interference among Mexican Americans at varying levels of each cultural indicator differently.

As I did with the main analyses, in order to determine if there were any extreme cases in the analyses that included these three variables and the other variables of interest (punishing responses, solicitous responses, relationship satisfaction, *simpatia*, acculturation, and generational status), I examined scatterplots to determine whether any of the variables met criteria for being outliers based on using Allison's criteria of ± 2 for studentized residuals for each of six regression analysis. For each regression, between two and five cases met criteria for being outliers. Just as I did with my main analyses, I decided not to drop any cases from these exploratory analyses, given my small sample

size and the resulting difficulties in detecting a medium effect size. Using Allison's cut-off score of $< .40$ for tolerance, I found that no variables exhibited problems of multicollinearity with life control or interference.

The results of the regression analyses indicate that, in the model that looked at the effect of punishing responses, relationship satisfaction, and *simpatia* on life control, 40% of the variability in life control was explained by the model ($f^2 = .67$). The model reached significance, $F(2, 57) = 20.91, p < .001$. While neither the three-way interaction, the two-way interactions, nor the main effect of *simpatia* and punishing responses were significantly associated with life control, I found that, once one partialled out the effects of the other variables, relationship satisfaction was significantly associated with life control, $t(59) = 6.38, p < .001$, indicating that higher levels of relationship satisfaction were associated with higher levels of life control. In addition, there was a non-significant trend for individuals higher in *simpatia* to be higher in life control, $t(59) = 1.89, p = .064$. Thus, as was the case with findings from my main regression analyses, these findings merely echoed the correlation-based findings.

When I looked at the dependent variable of interference with *simpatia* being entered into the model as the cultural indicator, 37% of the variability in interference was explained by the model, $F(2, 56) = 25.38, p < .001 (f^2 = .59)$. While neither the three-way interaction, the two-way interactions, nor the main effect of *simpatia* were significantly associated with interference, the main effects of relationship satisfaction and punishing responses were significantly associated with interference, echoing the findings from the correlation analyses. Specifically, lower levels of relationship satisfaction were associated with increased levels of interference, $t(58) = -4.30, p < .001$ and higher levels

of perceived punishing responses were associated with increased levels of interference, $t(58) = 2.77, p < .01$. Contrary to my hypothesis, the cultural indicator of *simpatia* did not act as a moderator for any of these findings.

When I looked at the dependent variable of life control with acculturation being entered into the model as the cultural indicator in lieu of *simpatia*, the results of the regression analysis indicated that 40% of the variability in life control was explained by the model ($f^2 = .67$). The model reached significance, $F(2, 58) = 20.70, p < .001$. Once again, neither the three-way interaction, the two-way interactions, nor the main effects of acculturation and punishing responses were significantly associated with life control. However, I found that, once one partialled out the effects of the other variables, life control was significantly associated with relationship satisfaction, $t(60) = 6.35, p < .001$. In addition, there was a non-significant trend for individuals lower in acculturation to be higher in life control, $t(59) = -1.91, p = .061$.

When I examined the model that included punishing responses, relationship satisfaction, and the cultural indicator of acculturation on interference, I found that 38% of the variability in interference was explained by the model, $F(2, 57) = 26.36, p < .001$ ($f^2 = .61$). While the three-way interaction, the two-way interactions, and the main effect of acculturation were not found to be significantly associated with interference, the main effect of relationship satisfaction was found to be significantly associated with interference, once one partialled out the effects of the other variables, $t(59) = -4.45, p < .001$, as was the main effect of punishing responses, $t(59) = 2.79, p < .01$, indicating that lower levels of relationship satisfaction and higher levels of perceived punishing responses to pain behaviors from one's partner were associated with increased levels of

interference. Once again, as was the case with the cultural indicator of *simpatia*, the cultural indicator of acculturation did not act as a moderator for any of these findings.

I obtained similar findings when I examined the model that included punishing responses, relationship satisfaction, and the cultural indicator of generational status on life control. The results of this regression analysis indicate that 40% of the variability in life control was explained by the model ($f^2 = .67$). The model reached significance, $F(2, 58) = 20.70, p < .001$. The three-way interaction, the two-way interactions, and the main effects of punishing responses and generational status were not significantly associated with life control. However, once again, the main effect of relationship satisfaction was significant, once one partialled out the effects of the other variables, $t(60) = 6.35, p < .001$, indicating that higher levels of relationship satisfaction were associated with higher levels of life control.

When I looked at the dependent variable of interference with generational status being entered into the model as the cultural indicator, 44% of the variability in interference was explained by the model, $F(3, 56) = 16.13, p < .001 (f^2 = .79)$. The three-way interaction and the two-way interactions were found not to be significantly associated with interference. However, the main effect of relationship satisfaction was found to be significant once one partialled out the effects of the other variables, $t(59) = -4.27, p < .001$, indicating that lower levels of relationship satisfaction were associated with increased levels of interference. In addition, the main effect of punishing responses was found to be significant, $t(59) = 2.52, p < .05$, indicating that higher levels of perceived punishing responses to pain behaviors from one's partner were associated with higher levels of interference, as was the main effect of generational status, $t(59) = 2.55, p$

< .05, indicating that those who had been in the U.S. for a greater number of generations experienced higher levels of interference. As with the two other cultural indicators, the variable of generational status was not found to act as a moderator for any of these findings, despite this having been predicted.

In summary, as was the case with tests of hypothesis 5, the results of these exploratory regression analyses only revealed several significant main effects, paralleling the correlation-based findings. Indeed, the results of the regression analyses failed to show a significant moderating effect for any of the three cultural indicators, findings that run against my hypotheses that the cultural indicators would significantly interact with perceived punishing responses and relationship satisfaction to impact life control and interference among Mexican Americans at varying levels of each cultural indicator differently.

Examination of the role of marital status. I did not think that Mexican American cohabiting and married men would show any differences in terms of the main variables examined in this study (pain severity, depressive symptomatology, relationship satisfaction, perceived partner punishing responses, perceived partner solicitous responses). I also did not expect that there would be differences between these two groups with regard to pain severity and depressive symptomatology depending on where participants fell on the continuum on the three cultural measures, how satisfied they were in their relationship, and what level of perceived partner responses to pain they reported. Nevertheless, I thought it would be interesting to look at correlation analyses between marital status and the variables mentioned above, as well as control for marital status in the regression analyses. Due to the large number of predictors in the tests of my main

hypotheses and due the fact that an examination of differences between married and cohabiting individuals was not the main focus of this study, marital status was only examined in the context of exploratory analyses and was only examined as a main effect. Examining how marital status interacted with the other variables would have been an interesting addition. However, given the already numerous interactions examined in the analyses, this would have resulted in too many predictors and inadequate power to test for these interactions.

The marital status variable was included in the first step of the six stepwise regression analyses that were tested in hypothesis 5 and the two stepwise regression analyses that were tested in hypothesis 6 and that examined pain severity and depressive symptomatology as the dependent variables. Marital status was not found to be significantly associated with any of the examined variables (pain severity, depressive symptomatology, relationship satisfaction, perceived partner punishing responses, perceived partner solicitous responses) in the correlation analyses nor were there any non-significant trends in the .05 to .10 significance range. In addition, marital status was not found to be a significant covariate in any of the eight regression analyses.

Examination of the role of recruitment site. L.A. participants were recruited from an advertisement in Spanish only and in a Spanish-language newspaper, as opposed to participants recruited from Denver and Northern California who were more likely than the L.A. participants to be English speaking. Thus, because the L.A. participants were likely to differ from those in the other two recruitment groups, I ran a few analyses to determine whether there were differences in certain key demographic and outcome variables (age, education level, family income, pain severity, depressive

symptomatology, *simpatia*, generational status, and acculturation) and whether these differences had an impact on my findings. Table 10 presents the means and standard deviations for these variables.

First, I performed a multinomial logistic regression analysis to assess prediction of membership in one of three categories of outcome (Denver group, Northern California group, and L.A. group) on the basis of various predictors: age, education level, family income, pain severity, depressive symptomatology, *simpatia*, generational status, and acculturation. The model was statistically significant, $\chi^2 = 73.50$, $p < .001$. Out of the eight predictor variables, only three variables reliably distinguished among the three recruitment groups: *simpatia*, generational status, and acculturation. Furthermore, as presented in Table 11, based on the Wald criterion, the results of the multinomial logistic regression indicate that only two variables separated individuals who were recruited from the L.A. community from those who were recruited either from the Denver area or Northern California: *simpatia*, $z = 5.68$, $p < .05$ (L.A. community vs. Denver area), $z = 4.32$, $p < .05$ (L.A. community vs. Northern California) and generational status, $z = 6.72$, $p < .05$ (L.A. community vs. Denver area), $z = 5.36$, $p < .05$ (L.A. community vs. Northern California). Thus, based on this model, I found that for every one unit increase in *simpatia*, participants' odds of having been recruited from the Denver area versus the L.A. community increased by 44 percent, controlling for other variables, while participants' odds of having been recruited from Northern California versus the L.A. community increased by 19 percent. In addition, for every one unit increase in generational status, participants' odds of having been recruited from the Denver area versus the L.A. community increased by 612 percent, while participants' odds of having

been recruited from Northern California versus the L.A. community increased by 523 percent. In other words, generational status was the most important predictor of recruitment group membership and the results indicate that each additional generation that a participant or his family had resided in the U.S. made it over six times more likely that a given participant was recruited from the Denver area rather than the L.A. community and over five times more likely that a given participant was recruited from Northern California rather than the L.A. community.

I also decided to control for recruitment site in the regression analyses. The recruitment site variable was included in the first step of the six stepwise regression analyses that were tested in hypothesis 5 and the two stepwise regression analyses that were tested in hypothesis 6 and that examined pain severity and depressive symptomatology as the dependent variables. Recruitment site was found not to be a significant covariate in any of the eight regression analyses.

In addition, I examined my main hypotheses specifically on the participants that were recruited from the L.A. community, the recruitment site that included the largest number of participants ($N = 32$). The results obtained when hypotheses 3 and 4 were tested (the hypotheses that included relationship satisfaction as the dependent variable) were not significant, both in terms of main effects and interactions. This is likely a result of the small sample size and the fact that the range on the cultural variables was further restricted by selecting participants who were mostly predominantly Spanish speaking. Given that I failed to find any effect on relationship satisfaction when testing hypotheses 3 and 4 on the L.A.-based participants, I did not test hypotheses 5 and 6.

Examination of potential moderating role of pain severity on the association between relationship satisfaction and depressive symptomatology. Given the high correlation that I found between relationship satisfaction and depressive symptomatology, I decided to examine whether pain severity moderated the relationship between these two variables. To do that, I conducted the following hierarchical regression, using the SPSS STEPWISE function: Depressive Symptomatology = $b_0 + b_1$ (Relationship Satisfaction) + b_2 (Pain Severity) + b_3 (Relationship Satisfaction x Pain Severity), with the main effects of relationship satisfaction and pain severity entered into the model first and the two-way interaction entered second. No significant Relationship Satisfaction x Pain Severity interaction emerged in this analysis.

Discussion

This study was conducted to gain a better understanding of the role of cultural indicators (*simpatía*, acculturation, and generational status) in moderating the influence of perceived spousal responses and relationship satisfaction on pain severity and depressive symptomatology, and to add to the research on pain and marital/cohabiting relationships in Mexican American men. In this discussion section, cultural-specific findings with regard to the hypotheses and related implications are discussed first and are followed by a discussion of findings that are not necessarily specifically tied to culture. Limitations of the present study and implications for future research in this area are discussed second.

Tests of Hypotheses and Related Implications

Comments specific to the hypotheses tested in the present study are included in the following section, along with implications of the findings and how these findings are related to previous research.

Culture-based findings. The present study is unique in that it is the first study to examine the pain experience among a sample of Mexican Americans who are, for the most part, first generation U.S. residents and low on acculturation. While my sample is not representative of the broader population of Mexican Americans, the uniqueness of the sample is noteworthy. Indeed, Mexican Americans who are recent immigrants and lower in acculturation are a numerically important yet understudied U.S. population that is often underrepresented even in research that is specifically conducted on Mexican Americans

and Latinos. The study does have several limitations, however. Indeed, the present study is characterized by a large number of hypothesized results that were found to be non-significant. Large main effect sizes were obtained in the case of the analyses that involved pain severity and depressive symptomatology as outcome variables. However, none of these analyses resulted in significant interaction-based findings involving the cultural variables. No additional interaction-based trends emerged when examining non-significant results in the $p = .05$ to $.10$ range. This lack of significant interaction-based findings and trends, along with the fact that only one interaction came out significant in the models that examined relationship satisfaction as an outcome variable, may indicate that the effect sizes involving the interactions may have been too small to be detectable with my current sample size. Given this pattern of findings, it is also possible that I need to rethink the role of cultural factors on partner responses' influence on pain severity and depressive symptomatology.

While problems with data collection and the analyses certainly contributed to the difficulties with finding support for my hypotheses (as discussed in the Limitations section), the most important contributor to the lack of significant findings has to do with the low variability in the three cultural measures. While the fact that my sample is disproportionately comprised of first generation Mexican Americans contributes to this study's uniqueness and importance, the low variability in the three cultural measures likely plays a role in the cultural indicators not having a significant moderating role. An examination of the ranges obtained for these three measures, in comparison to the possible ranges that can be obtained, does reveal that the sample consists of a preponderance of individuals who highly adhere to the *simpatia* script, who are highly

Mexican oriented in terms of acculturation, and who tend to be first generation Mexican Americans. The reason this sample is disproportionately comprised of first generation U.S. residents is that a majority of the participants are Spanish speakers who were recruited from an advertisement posted in a Spanish-language newspaper serving the Latino Los Angeles community. Not surprisingly, assessment of prediction of membership into my three recruitment groups (Denver group, Northern California group, and L.A. group) on the basis of various predictors indicates that the only three variables that reliably distinguish among the three recruitment groups are the three cultural indicators: *simpatía*, generational status, and acculturation. Out of these three cultural variables, generational status is the most important predictor of recruitment group membership, with each additional generation that a participant or his family had resided in the U.S. making it much more likely that a given participant was recruited from the Denver area rather than the L.A. community or Northern California.

More research with a better *simpatía* measure and a larger sample of participants should be conducted. It is unfortunate that the *simpatía* measure used by Triandis, et al. (1986) could not be located. In future studies, if this measure were available, a comparison of the results obtained by using both *simpatía* measures would be a worthwhile addition. However, a more ideal approach would be to create a new measure that not only focuses on relational issues that fit within the *simpatía* framework and other Latino cultural attitudes and beliefs (or cultural scripts), but that also focuses on the specific relational patterns that characterize chronic pain patients and their partners. Such a scale would thus likely integrate items from two of the scales used in this study: the *simpatía* scale and section 2 of the WHYMPI that assesses perceived partner responses to

patient pain behaviors. The reason that it would be beneficial to integrate other Latino cultural scripts is that it is possible that an aspect of the Mexican American experience that is not encapsulated by the constructs of *simpatia*, acculturation, or generational status is underlying this study's findings. Indeed, there are several other Latino cultural attitudes and beliefs that have been identified that may play an important role in the pain experience of married and cohabiting Mexican American men. For the purpose of the present study, I decided to focus on the Latino cultural script of *simpatia*, because it is the only cultural script that has been studied empirically, and it appeared particularly suited to exploring the pain experience of Mexican American individuals within the context of their relationship with their partner. However, it is likely that other cultural scripts would be well suited to an examination of the relational processes among Mexican American individuals with chronic pain. An example is *familismo*, or family interdependence, which represents the idea that Latinos maintain strong feelings of loyalty, reciprocity, and solidarity (Marin & Marin, 1991), while protecting family members both emotionally and physically (Cohen, 1979). Latinos have also been found to emphasize *personalismo*, or the building of personal relationships and a desire for personal connectedness (Falicov, 1996).

While I did find some noteworthy associations involving culture, findings that are an important first step in understanding the pain experience among an understudied population and that raise many important questions to be pursued in future research, readers should keep in mind that the main hypotheses of this study were not supported. The culture-based findings are briefly presented here and are discussed more at length subsequently.

One interesting finding that, while weak, supports my culture-based hypotheses is that, in the case of the solicitous partner responses, *simpatia* moderates the association between partner responses and relationship satisfaction. This finding suggests that, for those valuing *simpatia* or harmonious family relationships, solicitous responses are possibly seen as responses that enhance the relational bond between the couple, while they are, perhaps, seen as damaging to the relational bond by those who do not value *simpatia* as much.

In addition, my findings indicate that the Mexican American men in my sample who are more acculturated, have been in the U.S. for a greater number of generations, and are lower in *simpatia* have worse pain and mood-related outcomes than those who are on the other side of the continuum of these cultural indicators.

Because I did not find a moderating role for any of the three cultural indicators examined in this study, my findings only partially support my various hypotheses where distinctions were made between individuals who fall at either end of the continuum on the three cultural indicators. However, the various findings (all of which I discuss in detail below) are nevertheless interesting in that they suggest that certain patterns may be characteristic of individuals who, like most participants in my study, are first generation Mexican Americans who are low on acculturation. Some of these findings indicate that punishing responses are likely seen as negative and are responses that may run against the types of responses that Mexican American males are expecting from their female partners, even when they are displayed within the context of a relationship that is generally a source of satisfaction.

This study also raises questions about why levels of relationship satisfaction in the current sample are associated with levels of depression to a larger extent than in other studies examining relationship processes. While this strong association may have to do with the fact that the sample in the present study is comprised of pain patients, it is also possible that an aspect of the Mexican American experience explains this association.

Given my small effect sizes, even in the case of the significant findings, it is not clear how clinically relevant the current findings are, even though some of the findings do appear to mirror what has been described in the literature about relational tendencies that are more likely to occur among Hispanics than among individuals who are not of Hispanic heritage. In addition, although my results are clearly in need of replication with the use of measures that are better suited to examining the adherence to Latino cultural scripts among married and cohabiting pain patients, they nevertheless provide useful information about the relationship dynamics among Mexican American males in pain, and add to the body of literature that indicates that cultural factors play a role in the pain experience. The major clinical implication of my findings is that therapists, physicians, and hospital staff that treat and interact with pain patients and their partners should be trained to better understand these cultural differences. In particular, they should be made aware that perceived partner responses to pain may have a different impact on Mexican Americans than on Caucasians and that, perhaps, an aspect of the Mexican American experience contributes to a particularly strong association between relationship satisfaction and depression among Mexican American pain patients. Thus, targeting the relationship as a way to address depressive symptoms and pain severity appears particularly suited for those working with this patient population.

Perceived partner responses fail to interact consistently with cultural indicators to predict relationship satisfaction. The interaction of perceived partner responses by the cultural indicators (*simpatia*, acculturation, and generational status) was expected to be a significant predictor of relationship satisfaction. Indeed, it was expected that for the groups that were high in *simpatia*, less acculturated, and who had been in the U.S. for fewer generations, the perception of solicitous or punishing responses from their partner would impact their levels of relationship satisfaction differently than the groups that were low in *simpatia*, more acculturated, and whose families had been in the U.S. for a greater number of generations. This prediction was based on the *simpatia* script-related findings of Triandis and colleagues (1984) that Hispanics (and particularly less acculturated Hispanics) are more likely than non-Hispanics to expect high frequencies of positive behaviors and low frequencies of negative behaviors in the context of social relationships. However, punishing and solicitous responses failed to interact significantly and consistently with the cultural indicators to impact relationship satisfaction. In the case of the solicitous responses, the finding that the interaction between *simpatia* and solicitous responses is significantly associated with relationship satisfaction supports my prediction that *simpatia* would moderate the association between partner responses and relationship satisfaction and suggests that, for those valuing *simpatia* or harmonious family relationships, solicitous responses are possibly seen as responses that enhance the relational bond between the couple. While the types of feelings that solicitous responses evoke in patients was not measured in this study, it appears likely that solicitous responses are seen in a positive light by those who value *simpatia*, while they are perhaps seen as negative by those who do not value *simpatia* as much. Indeed, Newton-John and

de C. Williams (2006) found that patients do not necessarily perceive solicitous responses as positive (however, they did not examine what variables may underlie this difference in perception). Because Latino culture prescribes traditional sex-role beliefs (Canino et al., 1987; Vazquez-Nuttall, Romero-Garcia, & De Leon, 1987), it could be that, in the case of Mexican American males for whom the *simpatia* script is more salient, solicitous responses fall within the realm of responses that they expect their partners to engage in; thus, they are more likely to be dissatisfied with their relationship if those responses are not part of their partners' repertoire.

Given the small sample size and the fact that the above-mentioned finding, while significant, is not very strong statistically, it needs to be interpreted cautiously. Thus, while it is not clear how clinically significant this finding truly is, it nevertheless suggests that it may be important to assess for level of adherence to the cultural script of *simpatia* when working with Mexican American male patients, as a way to determine whether encouraging certain types of solicitous responses from the partner would be a helpful clinical intervention. For those patients who are found to highly adhere to the cultural script of *simpatia*, it would be helpful to encourage the partners to be attentive to patients' well behaviors (respond solicitously to well behaviors), but ignore pain behaviors, so as not to reinforce them.

My sample only comprised males with female partners; therefore, it is not known if this interaction-based finding would emerge with a sample of female pain patients or pain patients in same-sex relationships. Based on the literature about traditional sex-role beliefs, it is likely that this finding would not hold true for female pain patients. Indeed, traditionally, males are expected to be strong and provide for the family (*machismo*),

while females are expected to be nurturant and self-sacrificing toward the males (*hembrismo* and *marianismo*) (Boyd-Franklin & Garcia-Preto, 1994). Thus, the constructs of *hembrismo* and *marianismo* themselves are possibly highly correlated with the construct of *simpatia*, implying that females, generally speaking, are likely to adhere to the *simpatia* cultural script to a greater extent than males. Future studies with females could include measures of *hembrismo* and *marianismo* to determine if this is indeed the case and examine the particular role of solicitous responses on female patients.

Acculturation and other cultural indicators associated with a negative effect on depressive symptomatology and pain-related outcomes. Several culture-specific findings that come out of these analyses had not been initially predicted. As expected, the variables that I examined as outcome variables (pain severity, depressive symptomatology, affective distress, interference, and life control) were all significantly correlated with each other in the predicted direction. However, what was not predicted was that several of these outcome variables would be significantly associated with the three cultural indicators. Thus, in this sample, those individuals who demonstrate higher levels of adherence to the cultural script of *simpatia* are more likely to report lower levels of depressive symptomatology and experience higher levels of life control. In addition, those who are less acculturated experience lower levels of pain severity, lower levels of interference from the pain in their lives, and higher levels of life control. Similarly, those who have been in the U.S. for fewer generations experience lower levels of pain severity, lower levels of interference, and higher levels of life control. Effect sizes for all these associations are in the $r = .25$ to $.48$ range, with the two *simpatia*-based associations being the strongest and being medium in size.

The aggregation of these findings makes a good case for better adjustment in the face of pain among those individuals who are less acculturated, have been in the U.S. for fewer generations, and more highly adhere to the cultural script of *simpatia*. An examination of the literature on the role of acculturation on health and mental health outcomes indicates that the associations are not well understood and that acculturation may have a positive, negative, or no effect on the health and mental health of Hispanics, depending on the subject area, the measure of acculturation used, and factors such as age, gender, or other constructs, (see the review by Lara, Gamboa, Kahramanian, Morales, & Bautista, 2005). No studies have specifically examined the role of acculturation on pain and pain-related outcomes; thus, this study is important in its suggestion that, at least in the area of pain, among a sample of Mexican American men, acculturation and related cultural constructs are associated with a negative effect.

Perhaps the mechanism underlying these associations has to do with unhealthy lifestyle changes that are progressively adopted by Mexican Americans as they become more acculturated to U.S. culture. Certain behaviors that are associated with increased incidence or severity of back pain, such as smoking (e.g., Goldberg, Scott, & Mayo, 2000; Leboeuf-Yde & Yashin, 1995), obesity (e.g., Andersen, Crespo, Bartlett, Bathon, & Fontaine, 2001; Michel, Kohlmann, & Raspe, 1997) and low levels of general physical fitness (e.g., Harreby, Hesselsoe, Kjer, & Neergaard, 1997; Suni et al., 1998) have indeed been found to increase as Mexican Americans become more acculturated. Thus, less acculturated Mexican Americans have been found to smoke less (e.g., Coonrod, Balcazar, Brady, Garci, & Van Tine, 1995), consume healthier diets (e.g., Dixon, Sundquist, &

Winkleby, 2000), and engage in higher levels of overall physical activity (e.g., Marquez & McAuley, 2006) than do their more acculturated counterparts.

These findings also speak to the possible role of expectations and beliefs about pain in the mainstream culture. Perhaps, as Mexican Americans become more acculturated, their expectations about pain change in a way that negatively impacts the pain experience.

Significant correlations among cultural indicators, family income, relationship satisfaction, and outcome variables. The cultural indicators of acculturation, *simpatia*, and generational status are all significantly correlated with each other in the predicted direction. Specifically, more acculturated individuals are less likely to adhere to the cultural script of *simpatia* and are more likely to have been in the U.S. for multiple generations. In addition, individuals who more highly adhere to the cultural script of *simpatia* are more likely to have been in the U.S. for fewer generations than those who adhere to the cultural script of *simpatia* to a lesser degree. The associations involving *simpatia* are noteworthy, given that the researchers who devised the *simpatia* scale did not find a significant association between *simpatia* and acculturation, even though they had anticipated such an association (Griffith et al., 1998). The fact that the association between *simpatia* and acculturation is significant in the present study, whereas this same association is not significant in the study conducted by Griffith and colleagues may have to do with the use of different acculturation measures in both studies. The different findings may also stem from our differing samples: married and cohabiting Mexican American males with chronic pain in the present study vs. Hispanic male and female substance users in the Griffith and colleagues' study. Indeed, it is possible that one or

several of these differing variables (relationship status, presence/absence of chronic pain, presence/absence of substance abuse problem, sample comprised of Hispanics vs. subgroup of Mexican Americans, sample comprised of both males and females vs. only males) contributes to the differing associations in both samples. However, given that the cultural indicator of *simpatia* has not been widely examined, there is no indication from the literature as to which one of these variables, if any, might have contributed to a stronger association between acculturation and *simpatia* in the present study.

Of the three cultural measures, only the variables of acculturation and generational status show an association with family income, indicating that those with higher family incomes are more highly acculturated and tend to have been in the U.S. for multiple generations. These two associations are in support of my hypotheses as well as findings from the literature (e.g., Ghorpade, Lackritz, & Singh, 2004; Mason, 2004) that more acculturated individuals and individuals whose families have been in the U.S. for a greater number of generations earn more than those who are less acculturated and have been in the U.S. for fewer generations. *Simpatia*, however, does not demonstrate a significant association with family income, perhaps because *simpatia* is only modestly related to acculturation and generational status.

Interestingly, family income also shows an association with depressive symptomatology, pain severity, and relationship satisfaction, even though these associations were not originally predicted. Similarly, variables examined in the exploratory analyses, namely interference, life control, and affective distress, show an association with family income. Specifically, the findings indicate that those who have higher family incomes experience lower levels of pain severity, depressive symptoms,

affective distress, and interference from the pain in their lives, while they experience higher levels of life control, and have higher relationship satisfaction. An examination of the literature does indicate that the association between income and depression is robust (e.g. Lee, Chronister, & Bishop, 2008), including among Mexican Americans (Magni, Rossi, Rigatti-Luchini, & Merskey, 1992), while the findings on a possible association between income and pain severity are mixed, with some investigators reporting a positive relationship between income and pain severity among Mexican Americans (Magni, et al., 1992) and Hispanics (Portenoy, Ugarte, Fuller, & Hass, 2004), while others observe no significant association between the two (e.g., Lee, et al., 2008, with a non-Hispanic sample). A similarly mixed picture exists in the literature with regard to a possible association between income and relationship satisfaction. In this case as well, some studies point to a positive association between the two (e.g., Piotrkowski, Rapoport, & Rapoport, 1987), while other studies have not found a significant association between these two variables (e.g., Aubé & Linden, 1991; Patrick, Sells, Giordano, & Tollerud, 2007). A better predictor of marital satisfaction appears to be economic stress (Conger, et al., 1990), which is correlated with income, but is experienced by individuals along the entire income spectrum. Perhaps economic stress is more widely experienced among the individuals who comprise my sample, regardless of income (even though this sample's income is skewed toward lower income levels), because of the added stress of having to cope with a chronic pain condition and feeling more inadequate to meet perceived financial needs than would a sample comprised of individuals without persistent pain. This economic stress may, in turn, give individuals less opportunity to focus on their relationship with their partner, thereby impacting relationship satisfaction.

Economic stress was not assessed in the present study, but would be a useful variable to include in future research with a Mexican American sample of chronic pain sufferers to test the validity of these speculations.

Differences between both perceived partner responses variables and their association with pain severity, depressive symptomatology, and relationship satisfaction.

As predicted, perceiving one's partner to exhibit punishing responses is negatively associated with perceiving one's partner to exhibit solicitous responses. This finding echoes Kerns and colleagues' (1990) findings of a significant negative correlation between punishing responses and solicitous responses among a sample of married chronic pain patients and likely points to the fact that these two types of responses, especially in the current sample, are characteristic of different approaches to responding to a partner in pain. In addition, as predicted, those who perceive their partners to respond more solicitously also perceive their partners to respond in ways that distract them from their pain, indicating that these two responses may serve a similar function within the context of relationships.

When looking at the associations between the perceived partner responses to pain behaviors, the pain/mood-related outcomes, and relationship satisfaction, it is noteworthy that perceiving one's partner to exhibit punishing responses to one's pain behaviors is associated with decreased relationship satisfaction, increased pain severity, increased depressive symptomatology, increased affective distress, increased interference from the pain in one's life, and decreased life control. At the same time, perceiving one's partner to exhibit solicitous responses to one's pain behaviors is only significantly correlated with life control and shows non-significant trends of association with depressive

symptomatology and relationship satisfaction in the predicted direction. I did not expect to find a pattern of results in which almost none of the associations with the solicitous responses variable would be significant. However, the differing pattern that emerges with the solicitous and punishing responses generally fits with findings from the marital literature that suggest that negative interactions between partners more powerfully affect relationships than do positive interactions (Gottman, 1994; Markman & Hahlweg, 1993). Given that the sample for this study was comprised only of male participants, it is notable that evidence points to negative interactions being particularly psychologically damaging to men (Markman & Kraft, 1989), as opposed to women who appear to be more physiologically damaged by negative interactions (Kiecolt-Glaser, et al., 1993). Extrapolating from Markman and Kraft's findings, negative interactions likely have a damaging impact on both depressive symptoms and pain severity among male individuals with chronic pain, as was found in the present study with perceived punishing responses. These findings suggest that it may be beneficial for clinicians to target punishing responses over solicitous responses in the context of couple's therapy for Mexican American individuals with chronic pain. Such an intervention would appear to not only improve issues of pain and depression for the pain patient, but may also improve the relationship quality for both members of the couple, especially in couples where the pain patient is male, given that males appear more negatively affected by negative interactions than females. However, as discussed above, targeting solicitous responses in addition to punishing responses, while not necessarily highly beneficial for all Mexican American male patients, may have a role with a subgroup of Mexican American patients who highly adhere to the cultural script of *simpatia*.

Another possible target of intervention that would address the negative impact of punishing responses from female partners would be to focus on the likely cycle of high negativity/low positivity that each partner contributes to the relationship. Thus, the male partner for whom the pain may be expending large amounts of attentional resources may have less energy to devote to his relationship with his partner. Given that for females more than males, a decrease in positive interactions in the relationship is associated with dissatisfaction with the relationship (e.g., Gottman & Levenson, 2000), experiencing low levels of positivity from their partner may make it more likely that these female partners would respond in punishing ways to their partners' pain behaviors.

In the case of the association between punishing responses and pain severity, relationship satisfaction does not moderate findings. This is unlike the robust finding from Weiss and Kerns' (1995) study in which culture and ethnicity were not examined and which suggest that punishing responses are associated with high levels of pain for those who are maritally dissatisfied and low levels of pain for those who are maritally satisfied. According to Weiss and Kerns, compared to maritally unsatisfied individuals, individuals who are satisfied in their relationship are less likely to view their partner's punishing responses as unsupportive. Further, for those individuals, the punishing responses contribute to a reduction of pain behaviors and severity without increasing depression levels.

Because I did not find a moderating role for any of the three cultural indicators examined, this finding only partially supports my hypothesis where a distinction was made between individuals who are highly acculturated and those who are less acculturated. The only conclusion that I can draw from this finding is that among a

sample of predominantly first generation and less acculturated Mexican Americans, who are generally more likely to adhere to the cultural script of *simpatia*, punishing responses are likely interpreted as negative and perhaps as running against the types of responses that Mexican American males are expecting from their female partners, even when they are displayed within the context of a relationship that is generally a source of satisfaction.

While it was not tested in the present study, it is possible that the negative repercussions of being on the receiving end of punishing responses from one's partner would be especially damaging in couples where those responses have been used for prolonged periods of time. Future research should include a longitudinal design to test for the possible negative effects of punishing responses over time. A longitudinal design would also serve to verify the assumption that the directionality of the associations is from punishing responses to pain severity and depressive symptomatology, and not from expressions of pain and depressed mood to spousal reaction.

Relationship satisfaction is associated with pain severity and depressive symptomatology, but cultural indicators play no direct role. One consistent finding from the correlation analyses and the regression analyses, regardless of which cultural indicator appears in the regression analyses, is that lower levels of relationship satisfaction are associated with higher levels of pain severity and higher levels of depressive symptomatology. The exploratory analyses point to a similar pattern, whereby lower levels of relationship satisfaction are associated with higher levels of affective distress and interference and lower levels of life control. The associations involving pain severity and depressive symptomatology, while predicted to be significant, were unexpectedly high and represent the most important findings in terms of their statistical

significance. The positive association between relationship satisfaction and depressive symptomatology confirms findings from the literature linking depressive symptoms and marital satisfaction. Research demonstrates that links between these two variables exist in both directions (for reviews, see Gotlib & Beach, 1995; Whisman, 2001). According to some, the mechanism for this association is that a depressed individual behaves in ways that contribute to interpersonal conflict, which then leads to the maintenance or exacerbation of depressive symptoms (e.g., Davila, 2001). Alternatively, others have argued that the decreased social support and increased hostility in troubled relationships can precipitate depressive symptomatology (e.g., Beach, Sandeen, & O'Leary, 1990). The fact that the association between relationship satisfaction and depression is much higher in my study than that traditionally reported in the literature raises questions about what might be different about this particular sample that would result in such a strong correlation. It is possible that, in addition to the above-mentioned mechanisms, a third variable explains this association among my sample. Perhaps there is something that generally less acculturated Mexican Americans (most of my sample) who experience chronic pain expect in a relationship; thus, not receiving this could result in both lower relationship satisfaction and increased depression. One possibility is that this third variable is an aspect of support that differs from solicitous responses. It is also possible that the stronger association between relationship satisfaction and depression in my sample has to do with the fact that these individuals have the added stress of dealing with a chronic pain condition, which may exacerbate the link between relationship dysfunction and depression. It does not appear that level of pain severity moderates the association between relationship satisfaction and depression, however. Perhaps, those individuals

who are depressed and in pain, regardless of how severe their pain is, express more complaints (both physical and psychological) than those who are only in pain, with such behaviors possibly having a negative impact on the relationship with the partner.

With regard to the associations between relationship satisfaction and the variables of pain severity, interference and life control, they too suggest that perhaps similar mechanisms to those present in the relationship satisfaction-depression association are at play with pain-related variables. Thus, having chronic pain may contribute to interpersonal conflict because pain may make it more difficult to attend to the relationship. For some, the experience of being in pain, by resulting in reduced life control, may similarly take away important mental and emotional resources needed to attend to the relationship and may interfere with various aspects of life that increase positivity within the relationship.

Regardless of the specific mechanism that underlies the association between relationship satisfaction and depression, as well as relationship satisfaction and pain-related variables in the present study, these findings do point to the importance of the quality of the relationship with regard to pain and mood-related outcomes, regardless of the types of partner responses received. Based on this finding, it is likely that marital therapy that focuses on enhancing the quality of the relationship, by both helping couples learn to handle conflicts safely and learn ways to deepen the positive sides of their relationship (e.g., friendship, passion, commitment) (Markman, Stanley, Blumberg, 2001) may be helpful in minimizing depressive symptoms and pain among Mexican American pain patients. Of course, given the correlational nature of these data, no causal inferences can be made. Thus, it is possible that targeting pain and/or depression would be another

way to help these chronic pain patients enhance the quality of their relationship with their partner. Indeed, it may be that by improving these individuals' depressive and pain symptoms, they will then have more mental and physical energy to dedicate to their relationship. This, in turn, will likely contribute to positively impacting their partner's satisfaction with the relationship and the way that she responds to them when they are in pain, potentially creating a positive feedback loop that contributes to a further reduction in pain severity, depressive symptoms, and relational dissatisfaction in the individuals in pain. Assuming the latter is the mechanism underlying the present finding, it is likely that these individuals would still benefit from marital therapy to change relational patterns that may have become ingrained after many years of relating to their partner in a certain way.

Significant association between age and several key variables despite these associations not having been initially predicted. Interestingly, age was found to be significantly correlated with several variables, despite the fact that no association involving age was initially predicted. Thus, in my sample, older participants are more likely to have been in the U.S. for multiple generations, to have higher levels of pain severity and depression, to experience less solicitous responses from their partners, to be less satisfied with their relationships, and to experience higher levels of interference from the pain in their lives, in comparison to younger participants.

Literature is mixed with regard to whether there is an age-related effect on depression. Studies that control for such risk factors of depression as physical health problems and related disability find that older adults are not at greater risk for depression than younger adults (e.g., Blazer, Burchett, Service, & George, 1991; Lewinsohn, Rohde,

Seeley, & Fischer, 1991; Roberts, Kaplan, Shema, & Strawbridge, 1997). However, studies that do not control for those factors (e.g., George, 1989; Mirowky & Ross, 1992; Newmann, 1989) do tend to find an age-related effect on depression and support findings from the current study in which general physical health and disability were not controlled for. With regard to the association between age and relationship satisfaction, this association did not correspond to the U-shaped curve of relationship satisfaction that has been found among adult relationships across the lifespan, with greater relationship satisfaction found among younger and older couples (e.g., Anderson, Russell, & Schumm, 1983; Glenn, 1990) (a closer look at my data confirmed that the age and relationship satisfaction association was indeed not U-shaped). No studies have specifically examined potential age differences in the perception of solicitous responses. Research that has been conducted on “positive” (e.g., warmth) and “negative” (e.g., hostility) relational characteristics within couples suggests that older individuals perceive greater positivity from their partner than do younger individuals (Henry, Berg, Smith, & Florsheim, 2007), a finding that goes against the solicitous responses-age association that was found with this particular sample. However, as discussed previously, it is perhaps erroneous to assume that solicitous responses are seen as positive by all individuals, and this may explain why comparing my results to research on “positive” and “negative” relational characteristics may not necessarily be appropriate. With regard to pain severity, the pain literature, contrary to the current findings, indicates that there are no age effects on pain severity (e.g., Edwards 2006; Nicholas, Asghari, & Blyth, 2008).

Because of the cross-sectional nature of this study, it is unclear if the potential age-related findings within my sample are due to developmental processes that might

occur with age within a population of Mexican American men with chronic pain or are the result of a cohort effect. Two factors distinguish my sample from most of the samples on which the research that examines potential age-related effects has been conducted. This makes it difficult to untangle whether my differing results are due to the fact that participants that comprise my sample are dealing with chronic pain and associated difficulties or the fact that these associations may be different for Mexican Americans. It is likely that the experience of growing old is made more difficult by having to deal with chronic pain, which would explain why, in this sample, the older participants tend to be more depressed than the younger ones. Similarly, given that marital satisfaction often declines after the onset of a pain condition (e.g., Maruta, Osborne, Swanson, & Haling, 1981), it makes sense that a pain condition would lead to further declines in marital satisfaction. The vicious cycle of negative interaction and diminished positivity discussed previously is particularly relevant to older couples who have spent more time together and have had more time to contribute negatively to this vicious cycle, through their interactions. This would also explain why partners would be less willing to behave solicitously toward the person in pain, as the interactions between them become increasingly negative. Alternatively, and more relevant to the present study in which perceived partner responses rather than actual partner responses were examined, it is possible that persons in pain, after many years of experiencing negative interactions with their partner, would be less likely to perceive their partner to be acting solicitously, even on those occasions when they are.

It should be noted that, because of the large number of correlations that were examined, it is likely that some of the significant correlations that were not initially

predicted, including these age-related associations, are likely due to chance, especially those that run contrary to what the literature indicates. Because there are so many questions about the true reason for these significant age-related associations, future studies should attempt to replicate these findings to untangle chance findings from true findings that, while initially unexpected, may be the result of the uniqueness of this particular sample.

No role for marital status in this sample. Marital status was not found to be significantly associated with any of the main variables examined in this study (pain severity, depressive symptomatology, relationship satisfaction, perceived partner punishing responses, perceived partner solicitous responses), nor was it found to be a significant covariate in the regression analyses. These results may seem counterintuitive given the literature that examines differences between married and cohabiting individuals. However, they do appear to fit with findings that specifically examine relationships among Hispanics and Latin Americans. Indeed, literature suggests that there are many differences between married individuals and cohabiters. For example, as compared to married individuals, cohabiters have been found to have lower levels of education than married individuals (Rindfuss & Van den Heuvel, 1990), lower levels of happiness (Nock, 1995), lower levels of commitment (Thornton, Axinn, & Teachman, 1995), higher rates of disagreements (Brown & Booth, 1996), and higher levels of domestic violence (DeMaris, 2000; Stets, 1991). However, cohabitation or consensual unions (conjugal unions between men and women who have never gone through religious or civil marriage ceremonies) have deep historical roots in Latin American societies. These unions often produce children and are recognized both juridically and socially as a

form of marital union (Fennelly, Kandiah, & Ortiz, 1989). Thus, unlike cohabitation for Whites, cohabitation among Latin Americans and Hispanics in the U.S. appears to function as a surrogate marriage for individuals of lower socioeconomic status (Castro Martin, 2002; Goode, 1993). Based on these differences, it is likely that differences between Mexican American cohabiters and Mexican American married individuals may be smaller than the differences between these two groups among Whites. Most studies of cohabitation have focused on Caucasian participants and have discussed potential racial and ethnic differences only as a caveat to the interpretation of findings. Only one study has, to my knowledge, looked at ethnic differences between Mexican American and White married and pre-maritally cohabiting individuals (Phillips & Sweeney, 2005). This study focused on women and found that cohabitation before marriage is associated with decreased marital stability among White women, but increased marital stability among Mexican American women. Findings from the Philips and Sweeney study support the suggestion that cohabitation among Mexican Americans may not be comparable to cohabitation among Whites and may thus explain the lack of significant findings involving marital status in the current study. The present study offers a preliminary suggestion that marital status is not a significant variable when examining pain-related outcomes among married and cohabiting Mexican American pain patients. It should be noted, however, that the current study was not designed to specifically look at such differences and the analyses that were conducted to look at these differences merely involve confirming a null hypothesis. Thus, these analyses do not help explain the specific reasons for the lack of differences between married and cohabiting Mexican

American men who are in chronic pain. A more in-depth look at the role of marital status in the pain experience is therefore warranted.

Limitations

This study has a number of significant limitations that affect the interpretation of my findings. These are discussed below. Future research should address these limitations, so as to further refine our understanding of cultural and couple processes on the pain-related experiences of individuals with chronic back and neck pain.

Power and generalizability. My final sample size comprised 62 individuals and, due to missing data for one individual, most analyses were run on 61 individuals. Some of the effect sizes obtained for important analyses were small and may point to the fact that the cultural indicators may not have had as big a role as predicted. Even when I examined non-significant trends in the .05 to .10 range for the regression analyses, I noted only two additional main effects and no additional interaction-based findings. It is likely that the small effect sizes found for several important analyses would have been more likely to result in significant findings with a larger sample size, thus allowing for a better examination of the role of cultural indicators on perceived partner responses and pain-related outcomes. To obtain significant findings with these small effect sizes, samples ranging in size from 139 to 226 would have been required.

Increasing the number of participants in future studies will likely be a challenge for any researcher. Indeed, recruitment of individuals that met the criteria for the study proved very difficult. As outlined in the Methods section, participants were recruited in several different locations and through several different means (letters written by their own provider, face-to-face recruitment by their provider, advertisements in local Spanish-

and English-language newspapers, and flyers posted in medical clinics). Despite these efforts, the numbers of individuals that completed the entire study remained small. The strategy that generated the lowest percentage of participants who dropped out after the initial contact was having the provider personally invite participants to participate in the study. However, only one provider was willing to do this (a psychologist); thus, the numbers of overall participants remained low. One way to increase the number of participants in future studies, in addition to encouraging more providers to be directly involved in recruitment, would be to work in collaboration with Latino leaders and gatekeepers, such as faith leaders or community organizers, and to make better use of existing Latino community resources and agencies. By providing more opportunities for personal contact with a trusted individual, these strategies would likely contribute to increased willingness on the part of participants to become involved in a research study.

In addition, it is likely that had the inclusion criteria been less specific, the recruitment efforts would have generated a larger sample size (e.g., inclusion of both males and females, inclusion of pain complaints not limited to back and neck pain). However, knowing that recruitment was going to be a challenge, these inclusion criteria were meant to increase the specificity of the study. Indeed, there exist differences in levels of solicitous and punishing responses from one's partner across chronic pain conditions (Anderson & Rehm, 1984; Faucett & Levine, 1991). Thus, even though chronic back and neck pain are among the most common pain complaints, it is possible that the results from my select sample would not be generalizable to a larger chronic pain population comprised of individuals with varied pain conditions. Nevertheless, this study

provides a first step to understanding the role of partner responses among Mexican American chronic pain patients.

Need for similar studies with females, couples, and individuals without partners.

In addition to studies that include individuals with a larger variety of pain conditions than those that were included in the current study, there is also a need to include female participants. Indeed, males and females differ considerably in response to their spouses' distress (e.g., Rohrbaugh et al., 2002) and partner responses are associated with differing levels of pain, pain behaviors, and disability depending on the sex of the person in pain (e.g., Fillingim, Doleys, Edwards, & Lowery, 2003; Smith, Keefe, Caldwell, Romano, & Baucom, 2004). In addition, male spouses have been found to be more likely to respond solicitously than female spouses (Newton-John & de C. William, 2006). Furthermore, there may be particular issues that arise when both partners are in pain, with responses from one partner to their partner's pain behaviors perhaps impacting the types of responses of the other partner. These partner interactions in couples where both partners are experiencing pain would be very interesting to study in a similar sample of Mexican American participants, but also in a broader multi-ethnic sample, given that such a study has not been conducted with any population.

For some of the significant associations that do not directly involve partner responses (e.g., the associations pointing to worse pain and mood-related outcomes for Mexican American men who are more acculturated), it is possible that the associations would play out differently for individuals without partners. Thus, individuals without partners would be an interesting comparison group in future research.

Methodology in data collection and analyses. My recruitment efforts resulted in a disproportionate number of individuals who were first generation U.S. residents, thus resulting in higher numbers of individuals who were less acculturated and who adhered more highly to the cultural script of *simpatia*. The greatest number of participants came from an advertisement posted several times in a Spanish-language newspaper serving the Latino Los Angeles community. Given that readers of this newspaper are, for the most part, Spanish speakers, this recruitment method favored first generation U.S. residents. Attempts to recruit participants through English-language newspapers did not generate many responses. However, that my sample was comprised of a large proportion of less acculturated individuals and individuals of lower socioeconomic status is a unique aspect of this study and contrasts with other published relationship and pain-focused studies that have been conducted, none of which have, to my knowledge, focused on a mostly low acculturated minority population. Most of the studies that have examined pain-related experiences in a couples context make no mention of race or ethnicity in describing their patient population. This omission likely indicates that the majority of these samples are comprised of mostly Caucasian participants and/or that race and ethnicity are not demographic variables that are considered relevant by a majority of researchers studying the role of partner responses to pain.

Due to the fact that participation entailed the completion of paper and pencil questionnaires, it is likely that issues of literacy may have prevented some potential participants from participating in this study and may have led to scores on my measures that may not be fully trustworthy. The recruitment method relied on written information (newspaper advertisements, written advertisements posted in clinic bulletin boards,

recruitment letters from treating providers) that may have reduced the likelihood that completely illiterate individuals would have made the initial contact to inquire about the study. All recruiting materials specified, as an inclusion criterion, that participants be able to read and write in English and/or Spanish. Nevertheless, I reviewed and gave instructions for the entire set of questionnaires over the phone to one participant who was not completely illiterate, but who did have some difficulty reading the questionnaires. However, this was not necessarily an option that would have suited all participants who were unable to respond to the questionnaires by writing. Both the recruitment method and the questionnaire format constitute a limitation of the study given the fact that it likely contributed to a sample that was not fully representative of the population I sought to study. Recruitment in person would be one way around this problem. As for the data collection method, in-person interviewing would not only have resulted in more reliable data with a Hispanic population (Howard, Samet, Buechley, Schrag, & Key, 1983; Marin & Marin, 1989), but it would also have ensured that all participants, regardless of their level of literacy, could participate. Keeping the questionnaire format, a simple change that has been found to increase participants' understanding of questionnaires would have been to present all questionnaires in a dual language format where the English text was typed underneath the corresponding Spanish phrases (e.g., Hendricson, et al., 1989). In my study, participants were asked if they wished to receive the packets of questionnaires in English, Spanish, or to receive both sets. Only one participant opted to be sent the questionnaires in both languages. However, based on Hendricson and colleagues' findings, this dual language format may have increased comprehension of items even for

those participants who were not fully bilingual by giving them the opportunity to read both versions.

Because of the correlational nature of the present study, no causal inferences can be made regarding the observed relationships. For example, although the findings are consistent with a scenario in which perceived punishing partner responses contribute to increased pain severity, depression, and reduced relationship satisfaction, it is possible that the causal arrow operates the other way, with the experience of severe pain and high depression resulting in the partner exhibiting more punishing responses (or alternatively resulting in the person in pain perceiving their partner to exhibit more punishing responses, since perceived partner responses were measured in this study) and also resulting in more dissatisfaction with the partner relationship. Alternatively, a third variable may explain the observed associations.

Another issue that may have had an impact on my results is that I did not drop any outliers from my analyses, even though between three and five cases met criteria for being outliers, depending on which regression analysis was examined. All cases were kept, because I did not want to further decrease my already small sample size. The number of outliers was small; however, it is not known to what extent these outliers might have influenced the results of the current study.

A large number of analyses were conducted as part of this study. When large numbers of statistical comparisons are conducted, invariably, some of them will produce false positives. This is a concern with all significant findings in this study, but particularly with the many significant correlational findings that were not initially predicted and that ran contrary to what the literature indicates (such as the age-related

associations). A 95 percent criterion was used for all the comparisons that have been discussed. Thus, all comparisons that have been presented are statistically significant at $p = .05$ or better, meaning that there is a 5 percent chance that the difference is not a true difference, with findings that are statistically significant at the $p = .01$ level being the most meaningful. While alpha can be adjusted in the case of multiple comparisons, family-wise alpha adjustment has some drawbacks, most notably reduction of statistical power (e.g., O'Keefe, 2003; Rosenthal, 1979). Many of my analyses involved testing for interactions through regression analyses and I was thus faced with the additional problem of low statistical power for detecting regression-based interactions (Aiken & West, 1991). Because of this and since most of my analyses (with the exception, as mentioned above, of certain correlation analyses) were hypotheses tests and not exploratory analyses, I decided not to further reduce the statistical power in my study by using family-wise alpha adjustments. Instead, as suggested by Perneger (1998), I dealt with my multiple analyses by simply describing what alpha levels were found with each significant result, as well as noting which findings were not predicted and discussing them within that framework. Nevertheless, because of the increased risk of family-wise type I error, my findings are clearly in need of replication.

Simpatia scale and other measures. While a *simpatia* scale already available allowed me not to have to create a new scale and recruit participants for the sole purpose of validating the scale, it is likely that the scale, which was validated on a group of substance abusers, did not work as well on the sample that comprised my study.

Even though the internal consistency for the full *simpatia* scale is adequate, the scale may have been a better fit for my sample had the internal consistency of the

politeness subscale been better. It is possible that the shortness of this subscale, along with the fact that my sample is disproportionately comprised of first generation Mexican Americans, contributes to less variability in the scale, thus reducing its internal consistency. In the future, improvements to the *simpatia* scale could be made with particular focus on increasing the number of items of the politeness subscale. With regard to the factor structure of the politeness scale, results of the analyses indicate that two factors comprise this scale and that all four items that comprise the scale load adequately on either factor. However, it is possible that the results of the factor analysis are not accurate. Thus, future research with larger sample sizes would be better suited to verify the factor structure of the scale. In addition, the *simpatia* scale needs to be validated on a pain sample that comprises both males and females and a wider variety of pain complaints. Nevertheless, despite these weaknesses, this study contributes to the scale's first validation on a pain sample.

The scales used in the present study all had the advantage that they had already been translated into Spanish. However, other scales that have not yet been translated into Spanish would be interesting to examine within a sample of Mexican American married and cohabiting individuals with chronic pain, once they have been translated. In particular, several key marital measures would allow for a more in-depth examination of the relational patterns of Mexican American chronic pain patients, such as the 8-item Communication Danger Signs Scale (Stanley & Markman, 1997), which is a measure of negative couple interaction.

Need for additional partner responses information. As suggested by Newton-John and de C. William (2006), it is possible that the partner responses that I focused on,

namely solicitous responses and punishing responses, failed to adequately capture the true response repertoire of partners. For the purpose of this study, distracting responses were deliberately eliminated from the regression analyses due to the lack of robust findings associated with this type of partner response. In addition to these three categories of partner responses (punishing, solicitous, and distracting), which form the basis of the WHYMPI, Newton-John and de C. William identified two new categories that they labeled “observe only” and “hostile-solicitous.” There is currently no questionnaire that can be used to assess these two new categories of partner responses; however, should such a measure be developed, it is likely that examining solicitous responses, punishing responses, observe only, and hostile-solicitous responses would more accurately describe the experiences of pain patient that are similar demographically to my sample, as well as pain patients in general. Given that only one study has identified these two new categories of partner responses, it is clear that there is a need for additional studies that look at these particular responses.

In addition, it would have been helpful to get ratings of how positively the patients rated each partner response, so as to see what types of feelings are generated by the solicitous and punishing responses. It is likely that the feelings these responses generate would be better predictors of pain and mood-related outcomes in Mexican Americans who value *simpatia* than would the responses themselves. Indeed, the mistaken assumption made in this study was that solicitous responses would fit the *simpatia* script, while punishing responses would clash with the *simpatia* script and lead to negative outcomes. While this may have been the case for a significant proportion of participants, it may not have been the case for the entire sample.

Future Directions

Future research is required to better understand the role of cultural indicators on the pain experience of cohabiting and married Hispanic individuals. A large study that includes males and females, individuals who have pain complaints other than back and neck pain, and who come from Central and Latin American countries other than Mexico would be ideal as a way to increase generalizability of the findings. However, the sample would need to be large enough so as to allow for analyses that are specifically designed to look at differences across males and females, across various groups of pain patients, and across the many different groups that describe themselves as “Latino” or “Hispanic.” Furthermore, the fact that the current study includes a disproportionate number of participants who are first generation U.S. residents and are thus generally less acculturated can be seen as an asset of this study, because this population is often underrepresented in research studies. Given the lack of research conducted on this sub-population of Mexican Americans, future studies should specifically focus on this subgroup. In addition to empirical methods, qualitative research methods, such as interviews and focus groups, should be used, so as to obtain a richer and more complex understanding of the pain experience of first generation Mexican Americans. In addition to focusing on first generation Mexican Americans, it would also be important to conduct research that includes a better representation of Mexican Americans and Hispanics who fall along the entire acculturation spectrum.

Furthermore, there is a need for the creation of an improved measure of *simpatia* and other Latino cultural scripts. Future studies should also use advanced data collection techniques, including face-to-face interviews, as well as behavioral observations of pain

behaviors and couple interactions, so as to address the literacy issue that is a concern in the present study and to ensure that the data obtained are as reliable as possible. In addition, behavioral observations would be useful in studying the link between partner responses and pain behaviors per se, rather than pain severity, as was done in the current study, and would permit determination of the direction of the effect of partner responses and pain behaviors (i.e., seeing if actual partner responses are antecedents and/or consequences of patient pain behaviors). Future research should also include a longitudinal design to test the directionality of the associations found in this study.

As discussed by Newton-John (2002), it would be useful to assess partner's beliefs about the legitimacy of the pain problem, in light of Faucett and Levine's (1991) finding that partner responses appear to impact differently individuals with pain problems that may have different levels of "legitimacy." Indeed, when comparing a group of patients with so-called "organic pain problems" (rheumatoid and osteoarthritis) with patients with "non-organic" myofascial pain, Faucett and Levine found that punishing partner responses were associated with lower levels of pain intensity in the group comprised of arthritis patients, while punishing partner responses were associated with higher levels of pain intensity in the group comprised of patients with myofascial pain.

Furthermore, for the purpose of this study, so as not to further complicate recruitment efforts, partner data was not included. However, future studies could examine partners' perceptions of how helpful they think each one of their responses are and how these assessments match patients' own feelings about the responses. Including information about partner responses to well behaviors (i.e., behaviors associated with better physical functioning, such as exercising) as has been done by Schwartz and

colleagues (2005), in addition to focusing on responses to pain behaviors, would also provide a fuller picture of the experiences of couples coping with chronic pain.

Future research should also take into account the growing literature of how partner responses matter to a variety of mental health and physical health issues, including depression (Hooley, Orley, & Teasdale, 1986), hypertension (Ewart, Burnett, & Taylor, 1983), and cancer (Scott, Halford, & Ward, 2004). For example, it would be interesting to assess whether use of empathic communication is associated with pain outcomes, given that this communication style has been found to be associated with better adjustment for patients coping with cancer (Manne, Dougherty, Veach, & Kless, 1999), myocardial infarction (Coyne & Smith, 1991), and stroke (Stephens & Clark, 1997), and would fit well within a framework examining *simpatía* or the need for pleasant relationships among Mexican Americans. Indeed, it is likely that this style of communication found to be beneficial for a variety of patients, would be particularly beneficial for Mexican Americans coping with the stress of chronic pain and their partners.

Conclusions

Despite its limitations, the present study is the first to examine the role of perceived partner responses on pain severity and depressive symptomatology within a cultural framework. The fact that first generation U.S. Mexican Americans, an understudied population, comprise the majority of the sample further contributes to the uniqueness of this study. Of particular interest is the finding that solicitous responses may enhance the relational bond between the couple among those who value *simpatia*, while they may be damaging to the relational bond among those who do not value *simpatia* as

much. Further, this study provides evidence that being highly acculturated, having been in the U.S. for several generations, and being high in *simpatia* may be associated with worse pain and mood-related outcomes among Mexican American men with chronic pain. Unfortunately, the results of the present study do not allow for increased understanding of the association between perceived partner responses and pain/mood-related outcomes with the addition of the cultural indicators, but they nevertheless provide useful information about the relationship dynamics among Mexican American males in pain. Future research should attempt to address some of the limitations of this study by using improved measures of *simpatia* and other Latino cultural scripts and conducting longitudinal research on a larger and more diverse sample of participants who fall along the entire acculturation spectrum. Future studies should also specifically focus on the subgroup of first generation Mexican Americans, through both empirical and qualitative research methods. In addition, future studies should use improved measures of partner responses to pain behaviors that include the “observe only” and “hostile-sollicitous” responses, the two new categories of partner responses identified by Newton-John and de C. William (2006), as well as patients’ perceptions of the responses they receive from their partners. Future research should also examine partner’s perceptions of their own responses, as well as make use of advanced data collection techniques, including face-to-face interviews and behavioral observations of pain behaviors and couple interactions, rather than relying solely on paper and pencil measures, as was done in the present study.

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Table 1

Demographic Characteristics of the Sample: Means and Standard Deviations

Variables	Total sample (N = 62)		Married (N = 32)		Cohabitors (N = 30)		<i>t</i> score
	Mean	SD	Mean	SD	Mean	SD	
Age	41.2	12.8	44.6	12.2	37.6	12.5	2.23*
Education	11.8	2.9	11.8	3.6	11.8	2.1	-.03
Family Income	22,738	15,789	23,031	16,259	22,414	15,534	.15
Pain Duration (years)	9.7	11.8	11	11.6	8.1	11.9	1.01
Length of Relationship (years)	10.4	10.7	14.7	12.4	5.4	5.2	3.69**
Number of Children	1.6	1.5	2.1	1.6	1.2	1.4	2.36*
RSAT	48.4	17.2	47.5	17.0	49.4	17.7	-.44
<i>Simpatia</i> Scale	42.1	7.6	43.4	8.2	40.6	6.8	1.47

Notes. RSAT = Relationship Satisfaction Questionnaire. * $p < .05$, ** $p < .01$

Table 2

Demographic Characteristics of the Sample: Percentages

Variables	Total sample (N = 62)		Married (N = 32)		Cohabiting (N = 30)		t value
	N	%	N	%	N	%	
Age							2.23*
<30	12	19.2	3	9.3	9	30	
30-39	18	28.8	9	28	9	30	
40-49	16	25.6	10	31.1	6	19.8	
50-59	12	19.2	7	21.7	5	16.5	
60+	4	6.4	3	9.3	1	3.3	
Race							0.13
Caucasian/Hispanic	59	95.2	30	93.8	29	96.7	
Black/Hispanic	1	1.6	1	3.1	0	0	
Native Am./Hispanic	2	3.2	1	3.1	1	3.3	
Religion							1.36
None	5	8.2	2	6.2	3	10	
Catholic	49	80.3	25	78.1	24	80	
Protestant	1	1.6	1	3.1	0	0	
Seventh Day Adventist	2	3.3	0	0	2	6.7	
Other	4	6.6	4	12.5	0	0	
Education							0.36
Less than high school	15	24.2	9	28.1	6	20	
High school graduate	36	58.1	16	50	20	66.7	
Some college	5	8.1	3	9.4	2	6.7	
College graduate	6	9.6	4	12.5	2	6.7	
Number of Children							2.36*
No children	21	33.9	8	25	13	43.3	
1 child	10	16.1	2	6.2	8	26.7	
2 children	13	21	9	28.1	4	13.3	
3 children	11	17.7	9	28.1	2	6.7	
4+ children	7	11.3	4	12.4	3	10	
Family Income							0.15
<5,000	9	14.8	4	12.5	3	10	
5-14,999	12	19.7	5	28.1	7	23.3	
15-29,999	22	36.1	13	40.6	9	30	
30-49,999	15	24.6	7	21.8	8	27.7	
>50,000	3	4.8	2	6.2	1	3.3	

Employment Status							-0.11
Working	35	56.5	18	56.2	17	56.7	
Not Working	21	33.9	11	34.4	10	33.3	
Retired	6	9.7	3	9.4	3	10	
Worker's Compensation/ Disability Payment							-0.44
Yes	13	21	6	18.8	7	23.3	
No	49	79	26	81.2	23	76.7	
Pain Duration							1.01
6-12 months	5	8.5	1	3.1	4	13.2	
1-5 years	26	44.2	11	34.1	15	49.5	
5-10 years	10	17.0	8	24.8	2	6.6	
10-20 years	10	17.0	5	15.5	5	16.5	
>20 years	8	13.6	5	15.5	2	6.6	
Primary Site of Pain							-0.66
Back	44	71	25	78.1	19	63.3	
Neck	9	14.5	2	6.2	7	23.3	
Back and neck	9	14.5	5	15.6	4	13.3	
Surgeries for pain relief							-1.48
Yes	10	16.1	3	9.4	7	23.3	
No	52	83.9	29	90.6	23	76.7	
Generational Status							-1.73
1st generation	41	66.1	25	78.1	16	53.3	
2nd generation	7	11.3	3	9.4	4	13.3	
3rd generation	6	9.7	1	3.1	5	16.7	
4th generation	0	0	0	0	0	0	
5th generation	8	12.9	3	9.4	5	16.7	
Acculturation Level							-1.78
Very Mexican oriented	14	22.4	10	31	4	13.2	
Balanced bicultural	30	48.0	15	46.5	15	49.5	
Slightly Anglo oriented	9	14.4	4	12.4	5	16.5	
Strongly Anglo oriented	7	11.2	1	3.1	6	19.8	
Very assimilated	2	3.2	1	3.1	1	3.3	

* $p < .05$

Table 3

Descriptive Statistics for the Principal Variables

Variables	Mean	Median	SD	Range	Skewness	Possible Range
Pain Severity	3.73	3.83	1.45	5.33	-.27	0-6
Depression	20.02	18.00	11.29	48.00	.60	0-60
Punishing Responses	2.07	1.75	1.60	6.00	.44	0-6
Solicitous Responses	4.14	4.17	1.51	5.83	-.93	0-6
Recoded Solicitous Responses	4.16	4.17	1.27	4.00	-.039	3-6
Relationship Satisfaction	48.43	52.00	17.23	72.00	-.60	0-78
Simpatia	42.08	44.00	7.61	39.00	-.78	0-68
Acculturation	-.35	-.79	1.29	5.41	.92	-4 to +4
Generational Status	1.82	1.00	1.39	4.00	1.55	1-5
Recoded Generational Status	1.56	1.00	0.84	2.00	.98	1-3

Table 4

Correlation Matrix Representing the Relationship Among the Principle Variables Included in the Analyses and Relevant Demographic Variables

Variables	1	2	3	4	5	6	7	8	9	10
1. Acculturation	1.00									
2. <i>Simpatia</i>	-.29*	1.00								
3. Generational Status	.80*	-.22*	1.00							
4. Pain Severity	.30*†	-.15	.38**†	1.00						
5. Depression	.19	-.48**†	.19	.56**	1.00					
6. Solicitous Responses	-.19	.065	-.16	-.044	-.17	1.00				
7. Punishing Responses	.101	-.12	.19	.39**	.43**	-.32**	1.00			
8. Relationship Satisfact.	-.15	.31**†	-.19	-.49**	-.73**	.18	-.30*	1.00		
9. Age	.14	-.0031	.28*†	.36**†	.28*†	-.26*†	.17	-.37**†	1.00	
10. Family Income	.25*	.026	.24*	-.31**†	-.36**†	.086	-.19	.35**†	-.24*†	1.00

Notes. Ns range from 60 to 62 for each correlation.

* $p < .05$, one-tailed; ** $p < .01$, one-tailed.

*† $p < .05$, two-tailed; **† $p < .01$, two-tailed.

Table 5

Results of Hierarchical Regressions Predicting Relationship Satisfaction (Hypothesis 3)

Variable	Standardized coefficients (β)	<i>t</i> -value
Regression 1		
Punishing Responses	-.30	-2.38*
<i>Simpatia</i>	0.22	1.77*†
Punishing Responses by <i>Simpatia</i>	0.22	1.51
Regression 2		
Punishing Responses	-.30	-2.43*
Acculturation	-.15	-1.23
Punishing Responses by Acculturation	-.17	-1.18
Regression 3		
Punishing Responses	-.30	-2.43*
Generational Status	-.10	-.81
Punishing Responses by Generational Status	-.18	-1.25

* $p < .05$; *† $p < .10$ trend

Table 6

Results of Hierarchical and Multiple Regressions Predicting Relationship Satisfaction (Hypothesis 4)

Variable	Standardized coefficients (β)	<i>t</i> -value
Regression 1		
Solicitous Responses	0.11	0.85
<i>Simpatia</i>	-.18	-.52
Solicitous Responses by <i>Simpatia</i>	0.27	2.13*
Regression 2		
Solicitous Responses	0.34	1.98
Acculturation	0.58	1.31
Solicitous Responses by Acculturation	-.75	-1.74
Regression 3		
Solicitous Responses	0.31	1.96
Generational Status	0.53	1.23
Solicitous Responses by Generational Status	-.69	-1.64

* $p < .05$

Table 7

Results of Hierarchical Regressions Predicting Pain Severity and Depressive Symptomatology (Hypothesis 5)

Variable	Standardized coefficients (β)	<i>t</i> -value
Regression 1		
Punishing Responses	0.27	2.34*
Relationship Satisfaction	-.38	-3.27**
<i>Simpatia</i>	0.01	0.064
Punishing Responses by Relationship Satisfaction	-0.045	-0.15
<i>Simpatia</i> by Relationship Satisfaction	0.13	0.44
<i>Simpatia</i> by Punishing Responses	-.034	-.091
<i>Simpatia</i> by Relationship Satisfaction by Punishing Responses	-.023	-.093
Regression 2		
Punishing Responses	0.23	2.78**
Relationship Satisfaction	-.57	-6.51***
<i>Simpatia</i>	-.28	-3.37**
Punishing Responses by Relationship Satisfaction	0.30	1.41
<i>Simpatia</i> by Relationship Satisfaction	0.28	0.51
<i>Simpatia</i> by Punishing Responses	0.11	0.22
<i>Simpatia</i> by Relationship Satisfaction by Punishing Responses	0.26	1.31

Regression 3

Punishing Responses	0.27	2.3*
Relationship Satisfaction	-.41	-3.53**
Acculturation	0.17	1.56
Punishing Responses by Relationship Satisfaction	-.036	-.12
Acculturation by Relationship Satisfaction	0.19	1.73
Acculturation by Punishing Responses	0.12	1.03
Acculturation by Relationship Satisfaction by Punishing Responses	0.16	1.40

Regression 4

Punishing Responses	0.24	2.65*
Relationship Satisfaction	-.66	-7.42***
Acculturation	0.082	0.95
Punishing Responses by Relationship Satisfaction	0.29	1.27
Acculturation by Relationship Satisfaction	0.087	1.007
Acculturation by Punishing Responses	0.008	0.095
Acculturation by Relationship Satisfaction by Punishing Responses	0.016	0.19

Regression 5

Punishing Responses	0.23	2.01*
Relationship Satisfaction	-.37	-3.31**
Generational Status	0.23	2.12*
Punishing Responses by Relationship Satisfaction	0.007	0.026
Generational Status by Relationship Satisfaction	0.14	0.43
Generational Status by Punishing Responses	-.26	-.82
Generational Status by Relationship Satisfaction by Punishing Responses	-.040	-.16

Regression 6

Punishing Responses	0.24	2.65*
Relationship Satisfaction	-.66	-7.42***
Generational Status	0.035	0.401
Punishing Responses by Relationship Satisfaction	0.29	1.27
Generational Status by Relationship Satisfaction	0.061	0.63
Generational Status by Punishing Responses	-.15	-1.12
Generational Status by Relationship Satisfaction by Punishing Responses	0.004	0.034

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

Table 8

Results of Hierarchical Regressions Predicting Pain Severity and Depressive Symptomatology (Hypothesis 6)

Variable	Standardized coefficients (β)	<i>t</i> -value
Regression 1		
Sollicitous Responses	0.047	0.40
Relationship Satisfaction	-.47	-4.00***
<i>Simpatia</i>	0.001	0.006
Sollicitous Responses by Relationship Satisfaction	0.064	0.32
<i>Simpatia</i> by Relationship Satisfaction	0.089	0.30
<i>Simpatia</i> by Sollicitous Responses	0.042	0.34
<i>Simpatia</i> by Relationship Satisfaction by Sollicitous Responses	0.067	0.36
Regression 2		
Sollicitous Responses	-.037	-.44
Relationship Satisfaction	-.63	-7.17***
<i>Simpatia</i>	-.29	-3.26**
Sollicitous Responses by Relationship Satisfaction	-.10	-.69
<i>Simpatia</i> by Relationship Satisfaction	0.15	0.25
<i>Simpatia</i> by Sollicitous Responses	-.040	-.34
<i>Simpatia</i> by Relationship Satisfaction by Sollicitous Responses	-.083	-.54

** $p < .01$; *** $p < .001$

Table 9

Correlation Matrix Representing the Relationship Among the Variables Included in the Exploratory Analyses and Relevant Demographic Variables

Variables	1	2	3	4	5	6	7	8
1. Acculturation	1.00							
2. Simpatia		1.00						
3. Generational Status			1.00					
4. Pain Severity				1.00				
5. Depression					1.00			
6. Solicitous Responses						1.00		
7. Punishing Responses							1.00	
8. Relationship Satisfaction								1.00
9. Age								
10. Family Income								
11. Support	-.095	.011	-.101	.33	-.007	.58**	-.18	.31*
12. Interference	.28*†	-.19	.40**†	.77**	.59**	-.042	.44**	-.57**
13. Life Control	-.25*†	.37*†	-.27*†	-.50**	-.68**	.28*†	-.35**	.61**
14. Affect. Distress	.11	-.22	.22	.45**	.48**	-.036	.38**	-.43**
15. Distracting Responses	.02	-.07	-.06	-.07	-.080	.64**	-.094	.21

Notes. Ns range from 60 to 62 for each correlation.

* p < .05, one-tailed; ** p < .01, one-tailed.

*† p < .05, two-tailed; **† p < .01, two-tailed

Table 9 (continued)

Correlation Matrix Representing the Relationship Among the Variables Included in the Exploratory Analyses and Relevant Demographic Variables

Variables	9	10	11	12	13	14	15
1. Acculturation							
2. Simpatia							
3. Generational Status							
4. Pain Severity							
5. Depression							
6. Solicitous Responses							
7. Punishing Responses							
8. Relationship Satisfaction							
9. Age	1.00						
10. Family Income		1.00					
11. Support	-.090	.039	1.00				
12. Interference	.49**†	-.34**†	.077	1.00			
13. Life Control	-.16	.36**†	.24	-.45**	1.00		
14. Affect. Distress	.047	-.38**	-.16	.49**	-.57**	1.00	
15. Distracting Responses	-.24	.14	.55**†	-.060	.24	-.040	1.00

Notes. Ns range from 60 to 62 for each correlation.

* p < .05, one-tailed; ** p < .01, one-tailed.

**† p < .05, two-tailed; **† p < .01, two-tailed.

Table 10

Demographic Characteristics of the Sample Based on Recruitment Site

Variables	Los Angeles (N = 32)		Northern CA (N = 16)		Denver (N = 14)	
	Mean	SD	Mean	SD	Mean	SD
Age	38.0	11.5	41.4	14.4	48.1	11.5
Education	12.2	2.7	11.3	3.9	11.4	2.1
Family Income	19,581	12,140	26,250	15,276	25,714	22,197
Pain Severity	3.4	1.5	3.5	1.4	4.7	1.2
BDI Depression Score	18.8	12.2	18.8	9.9	24.1	10.5
<i>Simpatia</i> Scale	41.4	8.0	43.7	8.9	41.9	4.8
Generational Status	1.1	0.2	1.6	1.1	3.8	1.3
Acculturation Level	-0.9	0.6	-0.8	1.2	1.4	1.0

Table 11

Multinomial Logistic Regression Analysis Showing Significant Effects of Simpatia and Generational Status on the Odds of Having Been Recruited From a Particular Geographical Area

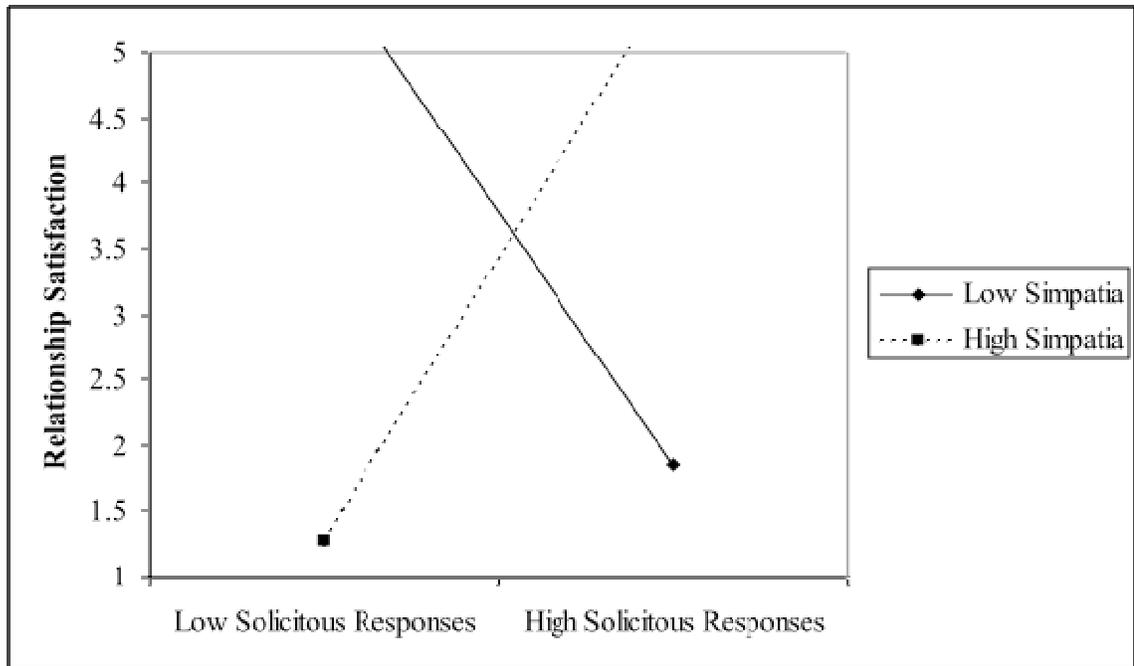
Recruitment group ^a		Estimate	SE	Wald
Denver area	<i>Simpatia</i>	0.44	1.19	5.68*
	Generational Status	6.12	2.36	6.72*
Northern California	<i>Simpatia</i>	0.19	0.089	4.32*
	Generational Status	5.23	2.26	5.36*

^aReference group is L.A. area.

* p < .05

Figure 1

Plot of the Interaction between Simpatia and Solicitous Responses on Relationship Satisfaction



Appendix A: Recruitment Letter

COMIRB #: 03-1043

Principal Investigator: Michael Craine, Ph.D.

Dear Sir,

I would like to inform you about research on back or neck pain you may be able to participate in. We hope information learned from this study will benefit Mexican American patients with chronic pain in the future.

- **You will be paid up to \$60**
- **This should take approximately 30 minutes**
- **Answer questions about your pain, culture, and relationship**
- **You can fill out the questionnaires at home and at your convenience**
- **Fill out the enclosed authorization form and the contact information form**
- **Return the forms in the enclosed envelope**

The study coordinator will contact you by phone to see if you qualify. You must be male, Mexican, Mexican American, or Chicano, in a heterosexual marital or cohabiting relationship, 21 years of age or older, have back and/or neck pain for at least three months, and read and write in English or Spanish

If you choose to participate in this study, you will be asked to answer questions on paper. These questions will be about: your pain, your relationship with your partner/spouse, your mood, and culture.

The process of participating in this study will be as follows. The study coordinator will send you a packet containing questionnaires and the consent form. One week after sending the packet to you, the study coordinator will contact you by phone. She will answer any questions that you may have, go over the specifics of the study, and obtain your informed consent for participation over the phone. If you are still interested in participating in the study following this phone conversation, you will be asked to fill out the questionnaires that you have received.

Contact the study coordinator with any questions at (303) 726-8755: Carolyn Freedman, M.A.

We apologize if you do not meet the eligibility criteria for this study and/or if you feel you have received this letter in error.

Taking part in this study is voluntary and you have the right to choose not to take part in this study. If you do not take part in the study, your doctor will still take care of you. You will not lose any benefits or medical care to which you are entitled. You have the right to leave the study at any time.

Venugopal Akuthota, M.D.
Director, Spine Center
University of Colorado Health Sciences Center

Appendix A cont.: Contact Information Form

Contact Information Form

Name: _____

Phone Number: _____

Best Times of the Day to Call: _____

Address: _____

This flyer was approved by the University of Denver's Institutional Review Board for the Protection of Human Subjects in Research on 11/14/2006.

***Do you have back and/or neck pain?
Are you Mexican or Mexican American?***

- **You will be paid up to \$60**
- **This should take approximately 30 minutes**
- **Answer questions about your pain, culture, and relationship on paper at home and at your convenience**
- **Multi-site research study; participation is voluntary; not part of clinic services**
- **Eligibility criteria: male, Mexican or Mexican American, in a heterosexual marital or cohabiting relationship, 21 years of age or older, back and/or neck pain for at least three months**
- **For information and to find out if you qualify for the study, call the study coordinator, Carolyn Freedman, M.A., at toll-free number (888) 361-3653**

Appendix C: Authorization Forms A and B

<p>Authorization To Release Health Information About Me For Research Purposes</p> <p><i>Authorization A: Research Recruitment</i></p>	<p>Research Area: Chronic back pain</p> <p>Study Title (if known): Chronic Pain, Relationships, and Culture</p> <p>COMIRB number (if known): 03-1043</p>
<p>I _____ (Patient's Full Name) authorize</p> <p><u>Michael Blei, M.D.; Anthony Dwyer, M.D.; Venugopal Akuthota, M.D.; Michael Craine, Ph.D.; Carolyn Freedman, M.A. and staff members of Denver Health & Hospital Authority; University of Colorado Hospital; VA Eastern Colorado Health Care System; University of Denver (respectively) working for him/her to use or give the following health information about me for the purpose of research recruitment:</u></p> <p>x <input type="checkbox"/> Name, Address and/or phone number x <input type="checkbox"/> Other (Specify) <u>Medical diagnoses, ethnicity, age</u></p> <p>This information will be given to: <u>Carolyn Freedman, M.A., Study Coordinator</u></p> <p>I give my authorization knowing that:</p> <ul style="list-style-type: none"> • I do not have to sign this authorization. If I do not sign it, my information will not be released for research recruitment. • I can cancel this authorization any time. <ul style="list-style-type: none"> ▪ I have to cancel it in writing. ▪ If I cancel it, the researchers and the people my information was given to may have already used the information, but they will not use it in the future. ▪ I can read the Notice of Privacy Practices at the facility where the research is being conducted to find out how to cancel my authorization. • The records given out to other people may be given out by them and might no longer be protected. • I will be given a copy of this form after I have signed it. <p>This authorization will expire on: <u>3/31/08</u> OR <input type="checkbox"/> Will not expire</p> <p>ADDITIONAL INFORMATION: _____</p>	

Patient's Signature	Date
_____ Signature of Legal Representative (If applicable)	_____ Date
_____ Name of Legal Representative (please print)	
_____ Description of Legal Authority to Act on Behalf of Patient	

<p>Authorization To Use or Release Health Information About Me For Research Purposes</p> <p><i>Authorization B: Enrollment into Research</i></p>	<p>Study Title: Chronic Pain, Relationships, and Culture</p> <p>COMIRB Number: 03-1043</p>
<p>I _____ (Full Name)</p>	
<p>authorize</p>	
<p><u>Michael Blei, M.D.; Anthony Dwyer, M.D.; Venugopal Akuthota, M.D.; Michael Craine, Ph.D.; Carolyn Freedman, M.A. and staff members of Denver Health & Hospital Authority; University of Colorado Hospital; VA Eastern Colorado Health Care System; University of Denver (respectively) working for him/her to use the following health information about me for research:</u></p>	
<p>No Yes</p>	
<p><input type="checkbox"/> x <input type="checkbox"/> Name and/or phone number</p>	
<p><input type="checkbox"/> x <input type="checkbox"/> Demographic information (age, sex, ethnicity, address, etc.)</p>	
<p><input type="checkbox"/> x <input type="checkbox"/> Diagnosis(es)</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> History and/or Physical</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> Laboratory or Tissue Studies: _____</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> Radiology Studies: _____</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> Testing for or Infection with Human Immunodeficiency Virus (HIV) (or results)</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> Procedure results: _____</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> Psychological tests: _____</p>	
<p><input type="checkbox"/> x <input type="checkbox"/> Survey/Questionnaire: BDI-II, West Haven-Yale Multidimensional Pain Inventory, RSAT, ARMSA-II, Simpatía Scale, and a demographic questionnaire</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> Research Visit records</p>	
<p><input type="checkbox"/> x <input type="checkbox"/> Portions of previous Medical Records that are relevant to this study</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> Billing or financial information</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> Drug Abuse</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> Alcoholism or Alcohol abuse</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> Sickle Cell Anemia</p>	
<p>x <input type="checkbox"/> <input type="checkbox"/> Other (Specify): _____</p>	
<p>For the Specific Purpose of</p>	
<p>x <input type="checkbox"/> Collecting data for this research project</p>	
<p><input type="checkbox"/> Other* _____</p>	
<p>*Cannot say "for any and all research", "for any purpose", etc.</p>	
<p>If my health information that identifies me is also going to be given out to others outside the facility, the recipients are described on the next page(s).</p>	
<p>x <input type="checkbox"/> No personally identifiable health information about me will be disclosed to others</p>	

The PI (or staff acting on behalf of the PI) will also make the following health information about me available to: (check all that apply and describe the type of the procedures done where applicable)

Recipient (name of person or group)

No Yes

x All Research Data Collected in this Study (if you check this box Yes, no other boxes need to be checked in this section)

- Name and phone number
- Demographic information (age, sex, ethnicity, address, etc.)
- Diagnosis(es)
- History and Physical
- Laboratory or Tissue Studies: _____
- Radiology Studies: _____
- Testing for or Infection with Human Immunodeficiency Virus (HIV) (or results)
- Procedure results: _____
- Psychological tests: _____
- Questionnaire/Survey: _____
- Research Visit records
- Portions of previous Medical Records that are relevant to this study
- Billing/Charges
- Drug Abuse
- Alcoholism or Alcohol
- Sickle Cell Anemia
- Other (Specify): _____

For the Specific Purpose of

- x Evaluation of this research project
- Evaluation of laboratory/tissue samples
- x Data management
- x Data analysis
- Other*: _____

**Cannot say "for any and all research", "for any purpose", etc.*

For additional Recipients, copy this page as needed.

I give my authorization knowing that:

- I do not have to sign this authorization. But if I do not sign it the researcher has the right to not let me be in the research study.
- I can cancel this authorization any time.
 - I have to cancel it in writing.
 - If I cancel it, the researchers and the people the information was given to will still be able to use it because I had given them my permission, but they won't get any more information about me.
 - If I cancel my authorization, I may no longer be able to be in the study.

- I can read the Notice of Privacy Practices at the facility where the research is being conducted to find out how to cancel my authorization.
- The records given out to other people may be given out by them and might no longer be protected.
- I will be given a copy of this form after I have signed and dated it.

This authorization will expire on: 3/31/2008 (Date) OR

The end of the research study

Will not expire

(Describe dates or circumstances under which the authorization will expire.)

ADDITIONAL INFORMATION: _____

Subject's Signature _____ Date _____

Signature of Legal Representative (If applicable) _____ Date _____

Name of Legal Representative (please print) _____

Description of Legal Authority to Act on Behalf of Patient _____

Appendix D: Newspaper Advertisement

\$60 completing questionnaires for study. To be eligible: male; have back and/or neck pain; Mexican, Mexican American, or Chicano; living with wife or female partner. Carolyn, toll-free number 1 (888) 361-3653.

Appendix E: Questionnaire Packet

The following pages contain a complete copy of the packet (English version only) that participants received in the mail. The pages are in the order that participants received them and in the same layout. Only one consent form version is included, even though three different consent form versions were used in the study (one for community participants, one for participants recruited from the Denver Health Medical Center and the University of Colorado Hospital, and one for participants recruited from the VA Eastern Colorado Healthcare System). In addition, only one version of the referral document is included, even though different versions were made for participants at various locations to take into account local resources.

Dear Mr. XXX,

Thank you for your interest in participating in the Chronic Pain, Culture, and Relationships study.

I will contact you on XXX at XXX. At that time, if you are still interested in participating in the study, I will explain the study to you, answer any questions that you might have, and obtain your informed consent for participation over the phone.

If you have any questions before I contact you, please feel free to call me at (888) 361-3653.

Study Coordinator
Carolyn Freedman, M.A.

Study Title: Chronic Pain, Relationships, and Culture

**Principal Investigator: Michael Craine, Ph.D.
Study Coordinator: Carolyn Freedman, M.A.**

**SUBJECT CONSENT FORM
Version 2**

Project Description. You are being asked to take part in a research study. The study looks at how culture and relationships affect Mexican, Mexican American, and Chicano men with chronic pain. Participants for this study will be recruited from Denver Health Medical Center, the University of Colorado Hospital, the VA Eastern Colorado Health Care System, the VA Greater Los Angeles Healthcare System, as well as the Los Angeles community and communities throughout Colorado, the South Bay area, the Monterey Bay area, and Napa Valley. Up to 149 patients will take part in this study. This study was approved by the University of Denver's Institutional Review Board for the Protection of Human Subjects in Research on November 14, 2006.

Procedures. If you agree to take part in this study, you will first be contacted by the study coordinator to see if you meet the eligibility criteria for participation in the study. If you meet the eligibility criteria, you will be sent a packet of questions in the mail. These will be about your pain, your relationship with your partner, your mood, and your culture. You will then once again be contacted by the study coordinator. At this time, she will answer your questions and obtain your informed consent for participation over the phone. Answering the questionnaires should take approximately 30 minutes.

Discomforts and Risks. You will be asked to answer questions about your relationship with your partner. You will also be asked to answer questions about your pain and your mood. By answering these questions, you may start to think about your pain, your relationship, and your mood in different ways than before. This could lead to some changes in your understanding of your pain, your relationship, and your mood. Thinking about these things may have some risks for you or your relationship. These risks are small. This study may include risks that are currently unknown. By taking the time to think more about your life and relationships, you may start to think about other services that you or others you care about may need. We have provided you with a sheet of information that includes contact numbers so that you will be aware of available services. We provide this sheet of information to ALL individuals who participate in the study.

Benefits. We hope information learned from this study will benefit other Mexican, Mexican American, and Chicano patients with chronic pain in the future. This study is not designed to treat any illness or to improve your health. Also, there are risks as mentioned in the Discomfort and Risks Section.

Cost to Subject. There is no cost to you for participating in this study. There will be no charge for anything required by the study.

Subject Payment. If you complete this study, you will receive up to \$60. You will receive your payment following our receipt of your questionnaires and your signed consent form. Specifically, you will receive \$60 if you send (postmark) the packet with the relevant forms within two weeks after having been consented over the phone, \$35 if you send (postmark) the packet within three weeks after having been consented over the phone, and \$15 if you send the packet thereafter.

Study Withdrawal. Taking part in this study is voluntary. You have the right to choose not to take part in this study. If you choose to take part, you have the right to leave the study at any time. If there are any new findings during the study that may affect whether you want to continue to take part, you will be told about them.

Invitation for Questions. The Principal Investigator for this study is Michael Craine, Ph.D. The Co-Principal Investigators are Michael Blei, M.D., Anthony Dwyer, M.D., M.P.H., and Venugopal Akuthota, M.D. You may ask any questions you have now. If you have questions later, you may call the study coordinator, Carolyn Freedman, M.A. at toll-free number (888) 361-3653.

If you have questions regarding your rights as a research participant, please call Dr. Dennis Wittmer, Chair of the University of Denver Institutional Review Board for Protection of Human Subjects at (303) 871-2431, or Sylk Sotto-Santiago from the University of Denver's Office of Sponsored Programs at (303) 871-4052.

Confidentiality. Your identity and all of your responses will be kept private. All of your answers will be kept in a locked room and seen only by the principal investigator and study coordinator. What you fill out will have no information identifying you except a research number. We will make every effort to keep your research records confidential, but it cannot be assured. Records that identify you and the consent form signed by you, may be looked at by the following people:

- Federal agencies that oversee human subject research
- University of Denver Institutional Review Board
- The investigator and research team for this study
- The sponsor or an agent for the sponsor
- Regulatory officials from the institution where the research is being conducted, to ensure compliance with policies or monitor the safety of the study.

Some things we cannot keep private. If you give us any information about child abuse or neglect we have to report that to Social Services. If you tell us you are going to physically hurt someone, we have to report that to the police. We will also need to report information about suicide to proper authorities.

The results of this research may be presented at meetings or in published articles. However, your name will be kept private.

Authorization. I have read this form or it was read to me. The study coordinator has explained the study to me and answered my questions. I have been told about the risks or discomforts of the study. I know that being in this study is voluntary. I may withdraw from this study at any time. The results of this study may be published, but my records will not be revealed unless required by law. (Initial all the previous pages of the consent form).

I choose to participate in this study.
I have received a copy of this consent form.

Signature: _____ Print Name: _____
Date: _____
Subject

Consent form explained by: _____ Print Name: _____
Date: _____

Investigator: _____ Date: _____

DEMOGRAPHIC QUESTIONNAIRE

1. Age: (in years) _____

2. Date of Birth: _____
Month/day/year

3. Ethnicity/Race: _____

4. Are you Mexican American or Chicano? Yes_____ No_____

5. Relationship Status: (Circle one) MARRIED

NOT MARRIED

6. If you are NOT married, do you have any plans to get married?

Yes_____ No_____

7. If you are married, when did you get married? _____
Month/year

8. If you are married and lived together with your spouse before getting married, when did you move in together? _____
Month/year

9. If you are living together but are NOT married, when did you move in together with your partner/fiancée? _____
Month/year

10. Have you been married before? Yes_____ No_____

11. Educational Background: (Circle highest level obtained)

Grade School	Secondary School	College	Graduate Student
1 2 3 4 5 6	7 8 9 10 11 12	1 2 3 4	1 2 3 4

12. Degree Obtained: (Circle highest degree obtained)

High School Diploma Associate Bachelor's Master's

Doctorate (e.g., Ph.D./M.D.)

13. Employment Information:

a. Are you currently working? Yes_____ No _____ Retired _____

b. Describe your occupation:

c. Is this the same occupation you had before your pain started? Yes ___ No___ N/A ___

d. If you are working, how satisfied are you with your current job? (Circle one)

0	1	2	3	4	5	6
Not at all			Somewhat			Very
Satisfied			Satisfied			Satisfied

d. If you are NOT working, has pain forced you to stop working? Yes ___ No__ N/A ___

e. If you are NOT working, what type of work did you do before your pain became a problem? _____

f. Are you being treated under Worker's Compensation? Yes ___ No ___

g. Are you currently receiving disability benefits? Yes ___ No ___

14. Information regarding Income:

a. Personal Income, including Worker's Compensation and Disability Benefits (Do not include partner's income). (Check one)

Under \$4,999 _____	\$5,000-9,999 _____	\$10,000-14,999 _____
\$15,000-19,999 _____	\$20,000-29,999 _____	\$30,000-39,999 _____
\$40,000-\$49,999 _____	\$50,000-59,999 _____	\$60,000-69,999 _____
Over \$70,000 _____		

b. Combined Income (Include your partner/spouse's income). (Check one)

Under \$4,999 _____	\$5,000-9,999 _____	\$10,000-14,999 _____
\$15,000-19,999 _____	\$20,000-29,999 _____	\$30,000-39,999 _____
\$40,000-\$49,999 _____	\$50,000-59,999 _____	\$60,000-69,999 _____
\$70,000-\$79,999 _____	\$80,000-89,999 _____	\$90,000-99,999 _____
\$100,000-\$109,999 _____	\$110,000-119,999 _____	\$120,000-129,999 _____
\$130,000-\$139,999 _____	\$140,000-149,999 _____	\$150,000-159,999 _____
\$160,000-\$169,999 _____	\$170,000-179,999 _____	\$180,000-189,999 _____
\$190,000-\$199,999 _____	Over \$200,000 _____	

15. Information regarding Pain:

a. When did your pain problem begin? _____
Month/year

b. What is the location of your pain? _____

c. How did your pain problem first start? (Car accident? Fall? Job-related injury, etc.?) _____

d. List all current medications you are taking for your pain problem:

18. Other information

- a. Have you ever had a period in your life where you felt down and depressed, every day, for 2 weeks in a row or longer? Yes ___ No ___
- b. If yes, when did it start? _____
Month/year
- c. Was that before your pain problems began? Yes ___ No ___
- d. Where were you born? Country: _____ City: _____
- e. Where were your parents born?
 - i. Father: Country: _____ City: _____
 - ii. Mother: Country: _____ City: _____
- f. Where were your grandparents born:
 - i. Paternal grandfather: Country: _____ City: _____
 - ii. Paternal grandmother: Country: _____ City: _____
 - iii. Maternal grandfather: Country: _____ City: _____
 - iv. Maternal grandmother: Country: _____ City: _____
- g. Circle the generation that best applies to you. Circle only one.
 - 1. 1st generation = You were born in Mexico or other country.
 - 2. 2nd generation = You were born in the USA; either parent born in Mexico or other country.
 - 3. 3rd generation = You were born in the USA, both parents born in USA and all grandparents born in Mexico or other country.
 - 4. 4th generation = You and your parents born in the USA and at least one grandparent born in Mexico or other country with remainder born in the USA.
 - 5. 5th generation = You and your parents born in the USA and all grandparents born in the USA.
- h. Ethnicity/Race of your wife/partner: _____
- i. Is your wife/partner Mexican American or Chicana? Yes _____ No _____

7. How much has your pain interfered with your ability to get enough sleep?
- | | | | | | | |
|-----------------|---|---|---|---|---|----------------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| No interference | | | | | | Extreme interference |
8. On the average, how severe has your pain been during the last week?
- | | | | | | | |
|-------------------|---|---|---|---|---|------------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Not at all severe | | | | | | Extremely severe |
9. How able are you to predict when your pain will start, get better, or get worse?
- | | | | | | | |
|----------------------------|---|---|---|---|---|----------------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Not at all able to predict | | | | | | Very able to predict |
10. How much has your pain changed your ability to take part in recreational and other social activities?
- | | | | | | | |
|-----------|---|---|---|---|---|----------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| No change | | | | | | Extreme change |
11. How much do you limit your activities in order to keep your pain from getting worse?
- | | | | | | | |
|------------|---|---|---|---|---|-----------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Not at all | | | | | | Very much |
12. How much has your pain changed the amount of satisfaction or enjoyment you get from family-related activities?
- | | | | | | | |
|-----------|---|---|---|---|---|----------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| No change | | | | | | Extreme change |
13. How worried is your spouse/partner about you because of your pain?
- | | | | | | | |
|--------------------|---|---|---|---|---|-------------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Not at all worried | | | | | | Extremely worried |
14. During the past week how much control do you feel that you have had over your life?
- | | | | | | | |
|------------|---|---|---|---|---|-----------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| No control | | | | | | Extreme control |
15. On an average day, how much does your pain vary (increase or decrease)?
- | | | | | | | |
|------------------|---|---|---|---|---|---------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Remains the same | | | | | | Changes a lot |

24. During the past week how successful were you in coping with stressful situations in your life?

0	1	2	3	4	5	6
Not at all successful						Extremely successful

25. How much has your pain interfered with your ability to plan activities?

0	1	2	3	4	5	6
No change						Extreme change

26. During the past week how irritable have you been?

0	1	2	3	4	5	6
No at all irritable						Extremely irritable

27. How much has your pain changed or interfered with your friendships with people other than your family?

0	1	2	3	4	5	6
No change						Extreme change

28. During the past week how tense or anxious have you been?

0	1	2	3	4	5	6
No at all tense or anxious						Extremely tense or anxious

Section 2

Instructions: In this section, we are interested in knowing how your spouse/partner responds to you when she knows that you are in pain. On the scale listed below each question, **circle a number** to indicate **how often** your spouse/partner generally responds to you in that particular way **when you are in pain**.

1. Ignores me.

0	1	2	3	4	5	6
Never						Very often

2. Asks me what she can do to help.

0	1	2	3	4	5	6
Never						Very often

3. Reads to me.

0	1	2	3	4	5	6
Never						Very often

4. Gets irritated with me.
- | | | | | | | |
|-------|---|---|---|---|---|------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Never | | | | | | Very often |
5. Takes over my jobs or duties.
- | | | | | | | |
|-------|---|---|---|---|---|------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Never | | | | | | Very often |
6. Talks to me about something else to take my mind off the pain.
- | | | | | | | |
|-------|---|---|---|---|---|------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Never | | | | | | Very often |
7. Gets frustrated with me.
- | | | | | | | |
|-------|---|---|---|---|---|------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Never | | | | | | Very often |
8. Tries to get me to rest.
- | | | | | | | |
|-------|---|---|---|---|---|------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Never | | | | | | Very often |
9. Tries to involve me in some activity.
- | | | | | | | |
|-------|---|---|---|---|---|------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Never | | | | | | Very often |
10. Gets angry with me.
- | | | | | | | |
|-------|---|---|---|---|---|------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Never | | | | | | Very often |
11. Gets me pain medications.
- | | | | | | | |
|-------|---|---|---|---|---|------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Never | | | | | | Very often |
12. Encourages me to work on a hobby.
- | | | | | | | |
|-------|---|---|---|---|---|------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Never | | | | | | Very often |

13. Gets me something to eat or drink.

0	1	2	3	4	5	6
Never						Very often

14. Turns on the TV to take my mind off my pain.

0	1	2	3	4	5	6
Never						Very often

BDI-II

Instructions: This questionnaire consists of 20 statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group.

1. Sadness

- 1 I do not feel sad.
- 2 I feel sad much of the time.
- 3 I am sad all the time.
- 4 I am so sad or unhappy that I can't stand it.

2. Pessimism

- 1 I am not discouraged about my future.
- 2 I feel more discouraged about my future than I used to be.
- 3 I do not expect things to work out for me.
- 4 I feel my future is hopeless and will only get worse.

3. Past Failure

- 1 I do not feel like a failure.
- 2 I have failed more than I should have.
- 3 As I look back, I see a lot of failures.
- 4 I feel I am a total failure as a person.

4. Loss of Pleasure

- 1 I get as much pleasure as I ever did from the things I enjoy.
- 2 I don't enjoy things as much as I used to.
- 3 I get very little pleasure from the things I used to enjoy.
- 4 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings

- 1 I don't feel particularly guilty.
- 2 I feel guilty over many things I have done or should have done.
- 3 I feel quite guilty most of the time.
- 4 I feel guilty all of the time.

6. Punishment Feelings

- 1 I don't feel I am being punished.
- 2 I feel I may be punished.
- 3 I expect to be punished.
- 4 I feel I am being punished.

7. Self-Dislike

- 1 I feel the same about myself as ever.
- 2 I have lost confidence in myself.
- 3 I am disappointed in myself.
- 4 I dislike myself.

8. Self-Criticalness

- 1 I don't criticize or blame myself more than usual.
- 2 I am more critical of myself than I used to be.
- 3 I criticize myself for all of my faults.
- 4 I blame myself for everything bad that happens.

9. Crying

- 1 I don't cry any more than I used to.
- 2 I cry more than I used to.
- 3 I cry over every little thing.
- 4 I feel like crying, but I can't.

10. Agitation

- 1 I am no more restless or wound up than usual.
- 2 I feel more restless or wound up than usual.
- 3 I am so restless or agitated that it's hard to stay still.
- 4 I am so restless or agitated that I have to keep moving or doing something.

11. Loss of Interest

- 1 I have not lost interest in other people or activities.
- 2 I am less interested in other people or things than before.
- 3 I have lost most of my interest in other people or things.
- 4 It's hard to get interested in anything.

12. Indecisiveness

- 1 I make decisions about as well as ever.
- 2 I find it more difficult to make decisions than usual.
- 3 I have much greater difficulty in making decisions than I used to.
- 4 I have trouble making any decisions.

13. Worthlessness

- 1 I do not feel I am worthless.
- 2 I don't consider myself as worthwhile and useful as I used to.
- 3 I feel more worthless as compared to other people.
- 4 I feel utterly worthless.

14. Loss of Energy

- 1 I have as much energy as ever.
- 2 I have less energy than I used to have.
- 3 I don't have enough energy to do very much.
- 4 I don't have enough energy to do anything.

15. Changes in Sleeping Pattern

- 1 I have not experienced any changes in my sleeping pattern.
- 2 I sleep somewhat more than usual.
- 3 I sleep somewhat less than usual.
- 4 I sleep a lot more than usual.
- 5 I sleep a lot less than usual.
- 6 I sleep most of the day.
- 7 I wake up 1-2 hours early and can't get back to sleep.

16. Irritability

- 1 I am no more irritable than usual.
- 2 I am more irritable than usual.
- 3 I am much more irritable than usual.
- 4 I am irritable all the time.

17. Changes in Appetite

- 1 I have not experienced any changes in my appetite.
- 2 My appetite is somewhat less than usual.
- 3 My appetite is somewhat greater than usual.
- 4 My appetite is much less than before.
- 5 My appetite is much greater than usual.
- 6 I have no appetite at all.
- 7 I crave food all the time.

18. Concentration Difficulty

- 1 I can concentrate as well as ever.
- 2 I can't concentrate as well as usual.
- 3 It's hard to keep my mind on anything for very long.
- 4 I find I can't concentrate on anything.

19. Tiredness or Fatigue

- 1 I am no more tired or fatigued than usual.
- 2 I get more tired or fatigued more easily than usual.
- 3 I am too tired or fatigued to do a lot of the things I used to do.
- 4 I am too tired or fatigued to do most of the things I used to do.

20. Loss of Interest In Sex

- 1 I have not noticed any recent changes in my interest in sex.
- 2 I am less interested in sex than I used to be.
- 3 I am much less interested in sex now.
- 4 I have lost interest in sex completely.

RSAT

On the scale below, circle the number that best describes the degree of satisfaction you feel in the various aspects of your relationship. The scale gradually ranges from the least possible satisfaction on the left to the greatest satisfaction on the right.

Please use this guide in circling the numbers:

- 0 = Very dissatisfied
- 1 = Moderately dissatisfied
- 2 = Slightly dissatisfied
- 3 = Neutral
- 4 = Slightly satisfied
- 5 = Moderately satisfied
- 6 = Very satisfied

	Very dissatisfied		Neutral		Very satisfied
1. Communication and openness.....0	1	2	3	4	5 6
2. Resolving conflicts and arguments.....0	1	2	3	4	5 6
3. Handling of finances.....0	1	2	3	4	5 6
4. Sexual satisfaction.....0	1	2	3	4	5 6
5. Recreational activities and leisure time.....0	1	2	3	4	5 6
6. Sharing duties and household chores.....0	1	2	3	4	5 6
7. Raising of children (skip this if you have no children).....0	1	2	3	4	5 6
8. Degree of affection and caring.....0	1	2	3	4	5 6
9. Relating to friends and relatives.....0	1	2	3	4	5 6
10. Intimacy and closeness.....0	1	2	3	4	5 6
11. Satisfaction with your role in the relationship.....0	1	2	3	4	5 6
12. Satisfaction with your partner's role in the relationship.....0	1	2	3	4	5 6
13. Overall satisfaction with your relationship.....0	1	2	3	4	5 6
14. Overall satisfaction with your life and self.....0	1	2	3	4	5 6

ARMSA-II

Circle a number between 1 and 5 next to each item that best applies.

1 = Not at all

4 = Much or very often

3 = Moderately

2 = Very little or not very often

5 = Extremely often or almost always

1. I speak Spanish.....1 2 3 4 5
2. I speak English.....1 2 3 4 5
3. I enjoy speaking Spanish.....1 2 3 4 5
4. I associate with Anglos.....1 2 3 4 5
5. I associate with Mexicans and/or Mexican Americans.....1 2 3 4 5
6. I enjoy listening to Spanish language music.....1 2 3 4 5
7. I enjoy listening to English language music.....1 2 3 4 5
8. I enjoy Spanish language TV.....1 2 3 4 5
9. I enjoy English language TV.....1 2 3 4 5
10. I enjoy English language movies.....1 2 3 4 5
11. I enjoy Spanish language movies.....1 2 3 4 5
12. I enjoy reading (e.g., books in Spanish).....1 2 3 4 5
13. I enjoy reading (e.g., books in English).....1 2 3 4 5
14. I write (e.g., letters in Spanish).....1 2 3 4 5
15. I write (e.g., letters in English).....1 2 3 4 5
16. My thinking is done in the Spanish language.....1 2 3 4 5
17. My thinking is done in the English language.....1 2 3 4 5

During the past 3 months, how often...

1. Did you think that others said positive things to you?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

2. Did you put down the culture of others?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

3. Did you openly disagree with others?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

4. Did you trust the judgment of others?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

5. Did others do things to you that you thought were rude or insulting?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

6. Did you treat others as your equal?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

7. Did you try to avoid conflicts with others?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

8. Did you think about disagreeing with others?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

9. Did you think others should have been more polite?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

10. Did you say good things about someone when talking to others?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

11. Were you polite to others?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

12. Did you point out the positive qualities of others?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

13. Did you do favors for others?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

14. Did you disagree with what others said?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

15. Did you think that others' opinions were different from yours?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

16. Did you think that your partner treated others with respect?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

17. Did you think that your partner treated you with respect?

0 (never) 1 (rarely) 2 (sometimes) 3 (often) 4 (always)

Getting More Help When There Are Serious Problems

Dear Participant,

Thank you for participating in the Chronic Pain, Relationships, and Culture study. You have helped us learn more about how culture and relationships affect Mexican American men with chronic pain. We are offering you this sheet of information to provide you information about community resources. By answering questions about your relationship with your partner, your mood, and your pain, you may come to think about these aspects of your life in ways that you have not done before. Since you are taking this time to think more about your life and relationships, it may also be a good time to think about other services that you or others you care about may need. **We provide this sheet of information to ALL individuals who participate in the study so that you will be aware of available services.**

Here are some areas where seeking additional help could be really important for you and your family.

Serious Marital or Other Family Problems or Stresses

- If you have serious marital or adult relationship problems where help is needed, you can seek counseling from someone who specializes in helping couples.

Substance Abuse and Addictions

- No matter what else you have to deal with in life, it will be harder if you or your partner, or another close family member, has a substance abuse problem.
- Drug or alcohol abuse and addiction robs a person of the ability to handle life well, have close relationships, and be a good parent.
- Alcohol abuse can also make it harder to control anger and violence.

If you experience these problems, you need to decide to get help with these problems to make your life and the life of those you love better. It will make it easier if your partner supports this decision.

Mental Health Problems

- There are many types of mental health problems, including anxiety, depression, and schizophrenia. These can place a great deal of stress on couple and family relationships.
- Depression is particularly common when there are serious relationship problems.
- Having thoughts of suicide is often a sign of depression. Seek help if you struggle with such thoughts.

The good news is that there are now many effective treatments for mental health problems with services available in all counties, including options for those with less means to pay.

Domestic Violence

- While domestic violence can take many forms, *the key is doing whatever is needed to make sure you and your children are safe.*
- While domestic violence of any sort is wrong and dangerous, experts now recognize that there are at least two very different types:
 - Some couples have arguments that get out of control, with frustration spilling over into shoving or slapping. This can be dangerous, especially if you don't take big measures to stop these behaviors.
 - The type of domestic violence that is usually the most dangerous and the most difficult to change is when an individual uses violence and force to scare and control their partner. Verbal abuse, forced sexual activity, and threats of violence are often seen with this type.
- Even if you are dealing with a less dangerous pattern of violence in your relationship, you may benefit from seeking marital or relationship counseling or seeking the advice of domestic violence experts.
- If you have any questions about the safety of your relationship, you should contact a domestic violence program or hot line.

The bottom line is doing what you need to do to assure that you and your children are safe. If you ever feel you are in immediate danger from your partner or others, call 911 for help or contact your Domestic Violence hot line.

Where Can We Get More Help?

If you, your partner, or your relationship experiences any of the above-mentioned problems, we strongly recommend that you get more help.

National Resources:

A national website with links for help with substance abuse and mental health issues:
www.samhsa.gov/public/look_frame.html

A national hotline for referrals to substance abuse treatment: 1-800-662-HELP

A national domestic violence hotline:
 SAFELINE 1-800-522-7233

Community Mental Health Centers:

ADAMS	Brighton Counseling Center	303-659-6280
	Westminster	303-427-1010
ALAMOSA	Comp. Community Mental Health	719-589-3671
ARAPAHOE	Aurora Community Mental Health Center	303-340-2340
ARCHULET A	Southwest Colorado Mental Health	970-264-2104
DENVER	Denver Counseling Center	303-778-8105

	Denver Mental Health Center	303-377-0563
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	Denver Health Medical Center Emergency Room and Inpatient Care	303-436-6000
	University Colorado Health Psychiatric Services	303-724-1000
	Mental Health Corporation of Denver (MHCD)	303-377-4300
	MHCD- El Centro Del Las Familias	303-504-1900
	MHCD - University Hills Clinic	303-504-6501
	Servicios De La Raza	303-458-5851
DOUGLAS	Tri-County Health Department	303-663-7650
EL PASO	El Paso County Health Department	719-578-3209
CLARK	Pike's Peak Mental health Center	719-572-6350
GARFIELD	Colorado West Counseling Services	970-945-2583
HUERFANO	Spanish Peaks Mental Health Center	719-545-2746
JEFFERSON	Jefferson Center for Mental Health	303-425-0300
LARIMER	Larimer County Mental Health Center	970-498-7610
PUEBLO	Spanish Peaks Mental Health Center	719-545-2746
RIO BLANCO	Colorado West Regional Mental Health Center	970-878-5112
WELD	North Range Mental Health Center	970-353-3686

Suicide Risk:

SUICIDE HOTLINE: 1-800-SUICIDE (784-2433). If you or someone you know is in immediate crisis, call the hotline for help.

Additional phone numbers to access resources regarding suicide by county/region (adapted from <http://www.endsuicide.org/phonenumbers.html>):

- Adams County 303-853-3500
- Arapahoe County 303-617-2300
- Boulder County 303-447-1665
- Denver County
 - For MHCD clients: 303-436-4100
 - Suicide & Crisis Control: 303-757-0988 and 303-789-3073
 - Comitis Crisis Line: 303-343-9890
- Jefferson County 303-425-0300
- Larimer County 970-498-7610 or 970-221-2114
- Eastern Colorado 970-522-4392
 - Includes: Logan, Sedgwick, Phillips, Yuma, Washington, Morgan, Elbert, Lincoln, Kit Carson, & Cheyenne Counties
- Midwestern Colorado 970-249-9694
 - Includes: Gunnison, Delta, Montrose, San Miguel, Ouray & Hinsdale Counties
- Western Colorado 970-945-2241
 - Includes: Moffat, Rio Blanco, Garfield, Mesa, Pitkin, Eagle, Grand, Jackson, Routt & Summit Counties
- Pikes Peak Region 719-635-7000
 - Includes: El Paso, Teller & Park Counties

- Southwest Colorado
970-247-5245
 - *Includes: Dolores, San Juan, Montezuma, La Plata & Archuleta Counties*
- San Luis Valley Region
719-589-3671
 - *Includes: Saguache, Mineral, Rio Grande, Alamosa, Conejos & Costilla Counties*
- Southeast Colorado
1-800-511-5446
 - *Includes: Crowley, Kiowa, Otero, Ben, Powers & Baca Counties*
- Pueblo County
719-545-2746
- Weld County
970-353-3686

Additional numbers for more information about suicide:

Suicide Education & Support Services Weld County 970-506-2737
 Suicide Prevention Partnership Pikes Peak Region 719-573-7447
 Suicide Resource Center Larimer County 970-635-9301
 S.A.F.E. Moffat County Visiting Nurses Association 970-824-8233
 Pueblo Suicide Prevention Center 719-544-1133
 Suicide Crisis Intervention Line Northwest CO only 970-879-1632

(800) 628-1696. Provides publications on parent/family support groups, financing, early intervention, various mental disorders, and other topics concerning children's mental health. Also offers a computerized data bank and a state-by-state resource file. Recording operates 24 hours a day.

National Foundation for Depressive Illness (800) 248-4344. A 24-hour recorded message describes symptoms of depression and gives an address for more information and physician referral.

National Mental Health Association (800) 969-6642. Provides brochures on clinical depression. Offers additional assistance and a referral service to mental health organizations. Makes referrals to mental health groups. Educational brochures available.

National Resource Center on Homelessness and Mental Illness (800) 444-7415. Provides technical assistance and information about services and housing for the homeless and mentally ill population. Sponsored by the Center for Mental Health Services, Substance Abuse and Mental Health Services Administration.

Also, both clergy and family physicians are usually well aware of resources for various needs in their communities, so consider asking them for suggestions.

National Clearinghouses for Mental Health Information

National Clearinghouse on Family Support and Children's Mental Health