Pain Catastrophizing and Social Support: Perceptions of Pain Communication and Others' Solicitous Responding in Undergraduates with Persistent Pain

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A thesis submitted to the Faculty of Graduate Studies

in partial fulfillment of the requirements for the degree of

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BY

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A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of Manitoba in partial fulfillment of the requirement of the degree

Of

MASTER OF ARTS

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Abstract

Pain catastrophizing has been identified as an important factor in persistent pain (e.g., Sullivan, Thorn, et al., 2001). The communal coping model (CCM) of pain catastrophizing (Sullivan, Tripp, & Santor, 2000) suggests that rather than simply a maladaptive cognitive coping strategy aimed at pain reduction, catastrophizing may serve to increase expressions of distress and thus ensure social support. This study examined pain catastrophizing in a sample 142 university undergraduates who experience persistent pain. Participants completed questionnaires measuring pain variables, catastrophizing, depression, discussion of pain, and perceived responding by others. Catastrophizing was found to be positively related to pain severity. Positive correlations were also observed between catastrophizing and participants' perceptions of the frequency of pain discussions with their dating partners and parents/guardians. Finally, catastrophizing was found to be a significant predictor of perceived solicitous responding within dating partner relationships. This study extends our knowledge of pain catastrophizing and supports the need for future research examining the communicative and social context of catastrophizing.

Pain Catastrophizing and Social Support: Perceptions of Pain Communication and Others' Solicitous Responding in Undergraduates with Persistent Pain

A substantial amount of research has identified *pain catastrophizing* as an important factor in both the experience and persistence of pain (Sullivan, Thorn, et al., 2001). Pain catastrophizing has been generally defined as an excessively negative "mental set" in response to pain (Sullivan, Thorn, et al., 2001, p.53) or "an individual's tendency to focus on and exaggerate the threat value of painful stimuli and negatively evaluate one's own ability to deal with pain" (Rosenstiel & Keefe, 1983, p. 33). The degree to which one engages in catastrophizing has been recognized as a particularly important factor in the adjustment of individuals with chronic pain conditions (Turk & Rudy, 1992).

In an attempt to consolidate the broad range of cognitions and behaviours associated with catastrophizing in the pain literature, Sullivan, Bishop, and Pivik (1995) have created the Pain Catastrophizing Scale (PCS). Factor analysis of the PCS has identified three basic components of catastrophizing: rumination, magnification, and helplessness. Rumination refers to the degree of difficulty one has inhibiting thoughts about ones' pain as well as the experience of excessive worry. Magnification is the amplification of the negative aspects of a painful situation or experience. Finally, helplessness refers to the level to which an individual feels unable to deal effectively with the pain.

Catastrophizing and Pain Variables

Catastrophizing and Pain Severity

Pain catastrophizing has been positively associated with greater reported levels of pain severity both in experimental pain procedures such as the cold pressor procedure

(Sullivan et al., 1995) and in a wide variety of clinical samples. These samples have included individuals with low back pain (Rosenstiel & Keefe, 1983), dental pain (Sullivan & Neish, 1999), menstrual pain (Walsh, LeBlanc, & McGrath, 2003) and rheumatoid arthritis (Keefe, Brown, Wallston, & Caldwell, 1989) among others. Although most of this research has involved middle-aged adult participants, the relationship between catastrophizing and pain severity has also been found among children (Piira, Taplin, Goodenough, & von Baeyer, 2002), young adults (Lefebvre, Lester, & Keefe, 1995), and older adult chronic pain patients (Haythornthwaite, Clark, Pappagallo, & Raja, 2003).

In general, the research linking catastrophizing and reported pain severity has been correlational. However, researchers have begun to employ other research methodologies in hopes of elucidating the potential causal relationship between these variables. For instance, in a study of patients with post-herpetic neuralgia researchers found that the level of pain catastrophizing at baseline pain level measurement significantly predicted pain levels at an 8-week follow-up (Haythornthwaite et al., 2003).

Catastrophizing and Pain-related Behaviours

In addition to its relationship to pain severity, catastrophizing has been associated with a number of pain-related behaviours. For example, studies have found catastrophizing to be associated with greater levels of medication use following surgery for breast cancer (Jacobsen & Butler, 1996). Catastrophizing has also been associated with greater levels of pain behaviours such as grimacing and sighing during a cold pressor test (Sullivan, Adams, & Sullivan, 2004) and the avoidance of activities that are expected to cause pain (Vlaeyen & Linton, 2000).

These findings of relationships between catastrophizing and certain pain-related

behaviours raise a number of important questions. For instance, should the pain-related behaviours associated with catastrophizing be viewed as forms of behavioural catastrophizing? Do these behaviours elicit responses from the environment (i.e., more personalized health care, sympathy from others) that, in turn, help the individual cope with the pain experience? Theorists in the area of pain catastrophizing have begun to examine these and other questions within the context of theoretical models in order to gain a more comprehensive understanding of the influences of catastrophizing.

Communal Coping Model of Pain Catastrophizing

Although catastrophizing has proven to be a consistent predictor of many elements of the pain experience, the theoretical underpinnings of this construct have been the topic of much debate. Until recently, catastrophizing has been generally conceptualized as a primarily cognitive process and, therefore, research has been focussed on cognitive processes such as schema-activation, appraisal, and attentional bias (see Sullivan, Thorn, et al., 2001 for a review). However, researchers have now begun to explore the possible social and behavioural processes involved in pain catastrophizing.

Sullivan, Tripp, and Santor (2000) proposed what they have called the communal coping model (CCM) of pain catastrophizing. Within this model, it is suggested that catastrophizing should be viewed as an element of an interpersonal style of coping. The CCM finds its basis in a general communal model of coping with stressors (Lyons, Mickelson, Sullivan, & Coyne, 1998). According to this model, communal coping refers to the "pooling of resources and efforts of several individuals (e.g., couples, families, or communities) to confront adversity" (Mickelson, Lyons, Sullivan, & Coyne, 2001, p. 186). Although this form of coping is most evident when stressors have a direct impact on two or more individuals (e.g., natural disaster), it may also come into play in

circumstances where only one individual is directly affected (e.g., personal illness) and others, such as partners, are indirectly affected. In a cooperative process, stressors such as illness are perceived as "'our' problem (a social appraisal) vs. 'my' or 'your' problem (an individualistic appraisal)" (Lyons et al., p. 583). More than simply a need for social support, communal coping is an orientation in which a person sees collaborating with others in order to solve problems as effective and preferential. This coping orientation is seen to have a number of benefits. For instance, perceiving a stressful situation as 'our' problem may serve to reduce feelings of being overwhelmed with the extent of the problem.

An important element of communal coping is that the characteristics of an individual's social relationships play a central role in whether or not he/she engages in this form of coping. For instance, according to this model, an individual is more likely to adopt this form of coping with the closest members of his/her social network (Lyons et al, 1998). However, an individual's approach to a particular stressor takes place within the context of a larger set of expectations and patterns of relating with those closest to him/her. For example, a person who sees herself as a "pillar of support" for family and friends may believe that joining forces with them to face her own problems would undermine this role.

Sullivan et al. (2000) have begun to apply this model of coping to the pain experience. Although catastrophizing scales are common among pain coping measures, there has been considerable debate over whether or not catastrophizing should be considered a coping strategy. Given this, some researchers have chosen not to include these scales in their research involving coping strategies (e.g., Haythornthwaite, Menefee, Heinberg, & Clark, 1998; Jensen & Karoly, 1991). Jensen and Karoly explain that they

chose not to include catastrophizing because "it assesses the degree to which subjects worry and display negativistic thinking in response to pain and not the degree to which patients use this strategy as a means of managing the stress associated with pain" (p.432). In response to this, Sullivan, Thorn, et al. (2001) suggest that perhaps the reduction of painful symptoms is not always the central goal of coping behaviour.

Although admittedly not a fully developed theory, the CCM proposes that catastrophizing is more than simply a maladaptive coping strategy for pain reduction. In fact, this theory suggests that catastrophizing may serve to increase expressions of distress and thus ensure an adequate level of social connection and support for the individual (Thorn, Ward, Sullivan, & Boothby, 2003). This, in turn, aids the individual in coping with his/her pain.

The CCM theoretical position has been supported in a number of studies that have found relationships between catastrophizing and a variety of pain behaviours. Most notably, a recent study by Sullivan et al. (2004) reports some interesting findings regarding communication of pain. In this study, 64 university undergraduates took part in a cold pressor pain procedure either alone or in the presence of an observer. The students were videotaped during the procedure and their interaction was coded for pain behaviours (e.g., grimacing, sighs, rubbing). Following the procedure, the students were interviewed regarding the coping strategies they had used during the procedure. These students were also asked to complete the Pain Catastrophizing Scale (Sullivan et al., 1995) as a measure of pain catastrophizing. The results of this study provided support for the CCM theory of pain catastrophizing. Participants with high levels of pain catastrophizing exhibited more pain behaviours when in the presence of an observer than when alone. In addition, those with high levels of catastrophizing reported using fewer additional coping strategies than

did those with low levels when an observer was present. These findings suggest that, when in the presence of an observer, individuals with high levels of pain catastrophizing are more likely to engage in behaviour that communicates their pain and less likely to engage in other, potentially more effective, coping strategies. It appears that the CCM of pain catastrophizing provides a potential explanation for the prevalence of catastrophizing as a pain coping strategy despite its ineffectiveness in reducing pain symptoms. The benefits of social connectedness and proximity may outweigh the costs of using such a strategy.

Pain and Social Variables

As personal relationships are an integral element of the CCM, the role of the social network in the pain experience is an essential consideration. The relationship between social support and health has been widely researched and strong support has been found for a positive relationship between these two variables. The level of an individual's social support has been found to be positively associated with health in a variety of populations with a wide range of health conditions (e.g., Ethgen et al., 2004; Geckova, Van Dijk, Stewart, Groothoff, & Post, 2003). Although the majority of this research has been focussed on positive social support, researchers have shown that negative aspects of social support, such as failed support attempts, are also significant predictors of health (Walen & Lachman, 2000).

Within the pain literature, findings regarding the relationship between social support and pain have been mixed (Thomas & Roy, 1999). Research has provided some evidence that social support acts as a buffer against many of the negative psychological correlates of chronic pain such as depression (e.g., Franks, Cronan, & Oliver, 2004). However, other studies have not found this buffering effect (Kraaimaat, Van Dam

Baggen, & Bijlsma, 1995).

Marital satisfaction also appears to be an important factor in the level of psychological distress experienced by individuals with chronic pain. In a study of chronic musculoskeletal pain patients, regression analysis found that marital satisfaction and pain severity/disability were independently related to depressive symptoms (Cano, Gillis, Heinz, Geisser, & Foran, 2004). Marital satisfaction also appears to play a mediating role in the relationship between the level of negative responding to pain behaviours by chronic pain patients' spouses and the depressive symptoms exhibited by the patients (Cano, Weisberg, & Gallagher, 2000). These results indicate that appraisal of the quality of the relationships within a person's social support network is an important factor in the relationship between social support and the negative effects of chronic pain.

Fordyce's (1976) introduction of the role of operant behavioural principles within the chronic pain experience has greatly influenced the direction of pain research. Since that time, much research has explored the assessment and treatment of chronic pain from a behavioural and cognitive-behavioural perspective (Keefe, Dunsmore, & Burnett, 1992). An essential element of this approach is that pain is experienced within a social context and, therefore, people within an individual's social network are sources of reinforcement for pain behaviours. Individuals with chronic pain will also act in ways that reinforce particular responses from those within their social networks.

Although the operant conditioning perspective of pain behaviour has received considerable support, a number of researchers have suggested that this is an overly simplistic view of the interactions that occur within the social network of individuals with chronic pain (Roy, 2001). Recent studies using daily diary methodologies have allowed for a more in-depth analysis of these relationships (Feldman, Downey, & Schaffer-Neitz,

1999; Holtzman, Newth, & Delongis, 2004). For example, Holtzman et al. found that positive perceptions of social support were related to the use of a greater variety of coping strategies. Interestingly, however, the coping strategies were not always associated with positive effects on pain severity. For instance, greater social support was associated with active problem solving but this was, in turn, associated with greater pain severity. The authors suggest that the social support experienced by these individuals may have served to encourage them to overexert themselves thereby exacerbating their pain.

Along similar lines, the role of pain behaviours in the context of marital conflict has also been found to be important. Schwartz, Slater, and Birchler (1996) conducted a study examining the use of pain behaviours in response to marital conflict among male chronic back pain patients. For this analysis, pain behaviour responses included behaviours such as moaning or going to lie down during times of marital conflict. This study found that both the patients and their spouses reported that the patients responded to conflict with pain behaviours more often than with either active responses (e.g., complaining) or passive responses (e.g., ignoring). These results support the clinical observations by Roy (1989) that pain plays a significant role in communication within families of chronic pain patients.

From the results of these studies we see that the relationship between pain and social support is far from simple. As Thomas and Roy (1999) suggest, for too long research in this area has assumed an all-or-nothing approach to social support that has resulted in the oversimplification of the issue and the limited utility of research findings. A multi-dimensional view of the relationship between social support and health appears to be particularly important when examining these variables within close relationships

(Burman & Margolin, 1992).

Catastrophizing and Disclosure/Communication

One of the most pressing issues in the examination of the CCM of pain catastrophizing is the need for the identification of behaviours that can by categorized as catastrophizing behaviours (Thorn et al., 2003). As discussed above, Sullivan et al. (2004) found that those with high levels of pain catastrophizing displayed greater frequency of pain behaviour, such as grimacing and rubbing, when in the presence of an observer than when alone. Given these findings, it is likely that verbal communication regarding one's symptoms/pain experiences is also associated with higher levels of pain catastrophizing. This verbal communication of the experience of, and concerns about, pain would seem to be particularly important from the viewpoint of the CCM (Lyons et al., 1998). In order for individuals to approach the stresses of persistent pain in a communal coping fashion, they must communicate aspects of their pain experience to those with whom they are the closest.

Examination of the findings of a prospective study of self-efficacy and pain behaviours provides support for this hypothesis (Asghari & Nicholas, 2001). In this study, those who reported high levels of catastrophizing at the beginning of the study also reported increasing complaint behaviour over the 9-month study-period. Although the authors did not provide potential explanations for these results, the findings suggest that the verbal communication of the pain experience, at times through complaining, is an important element of pain catastrophizing.

Along similar lines, Sullivan and Neish (1999) examined the effects of a disclosure manipulation on the pain severity levels of catastrophizers compared to non-catastrophizers during dental hygiene treatment. The experimental manipulation

consisted of the participants completing a record of the thoughts and feelings they normally experience during dental procedures. The control group for this study was asked to complete a record of their general activities during the previous day. The results of this study supported the hypothesis that disclosure would provide a benefit for catastrophizers in terms of pain severity. In the control condition, catastrophizers' pain ratings were significantly higher than were those of non-catastrophizers. However, in the disclosure condition the two groups did not differ significantly on pain rating. These results remained significant even when controlling for the emotional distress of the individuals.

The data from this study suggest that individuals who report high levels of catastrophizing are likely to benefit from some type of disclosure of their thoughts and feelings about painful experiences. In contrast, those with low levels of catastrophizing do not appear to experience this benefit. One possible explanation for the benefits of disclosure is that it provides an opportunity to release the emotions associated with these experiences (Sullivan & Neish, 1999). However, as the results remained significant even when emotional distress was controlled for, the authors suggest that this is likely not a complete explanation of the findings.

One clear difficulty in the application of these results is that the disclosure of thoughts and feelings regarding pain is seldom done in the form of written thought-records. In most cases, this disclosure will take place in the context of conversations with family, friends, or healthcare professionals. Within the context of relationships, the effects of disclosure may vary. For instance, discussing the pain experience may lead to an increase in support or it may lead to frustration on the part of the significant other. These two results would certainly have differing impacts on the pain experience. The current study takes an initial step in analyzing the role of communication of the pain

experience within close relationships.

Pain and Solicitous Responding

Solicitous Responding and Pain Severity. Studies examining the role of significant others in the pain experience of chronic pain patients have focussed largely on the reinforcement of pain behaviours through "solicitous" responding. Solicitous responding consists of behaviours that positively or negatively reinforce pain behaviours in another individual or behaviours that fail to encourage or actively discourage healthy behaviours (Newton-John, 2002). For example, an individual might moan in the presence of a significant other leading to the response of an expression of sympathy and offers of assistance. This *solicitous* responding would likely act to reinforce the pain behaviour of moaning.

Solicitous responding has been found to be associated with patient activity levels (Flor, Kerns, & Turk, 1987) as well as reported levels of pain severity (Weiss & Kerns, 1995). Once again, however, these relationships do not appear to be straightforward. The relationship between solicitous partner responding and pain variables has been found to be mediated by a number of other variables.

For example, a study examining potential sex differences in the relationship between solicitous responding and pain found mixed results (Fillingim, Doleys, Edwards, & Lowery, 2003). In this study, the researchers found perceived partner solicitous responding to be associated with greater pain severity for both sexes. However, solicitous responding was associated with greater self-reported disability due to pain for men but not for women. On the other hand, reports of higher levels of partner solicitousness was associated with greater interference of pain in everyday activities as well as lower general activity levels and lower pain tolerance for women but not for men. Fillingim et al.

suggest that there may be important differences in relationship factors between couples in which the female has chronic pain and the male is solicitous and those in which the reverse is the case. Whether this difference lies with the individuals with chronic pain, the spouses, or both is a matter for further investigation. Given the potential for differences between sexes in the area of solicitous responding, future research should include sex as a variable for analysis.

The association between solicitous responding and pain severity has also been examined within the context of marital satisfaction (Kerns, Haythornthwaite, Southwick, & Giller, 1990). The results of this study indicated that the interaction of spouse solicitous responding and marital satisfaction was a significant predictor of pain severity. Specifically, the findings suggest that solicitous responding is associated with greater pain severity within the context of a satisfying marriage but has little or no association within an unsatisfying marriage.

Solicitous Responding and Pain Behaviour. Along with pain severity, solicitous responding has also been linked to more frequent pain behaviour in a number of studies. For example, using direct observation, Romano et al. (1992) conducted a sequential analysis of pain behaviour and partner solicitous behaviour. This study included chronic musculoskeletal pain patients and their spouses/partners as well as a control group of couples. For analysis purposes, one person in each of the control couples was designated as the "patient". The chronic pain and control groups were compared on a variety of variables (e.g., age, education level, marital satisfaction). Of these variables, the only significant difference was that the pain patients in the chronic pain group were more likely to be unemployed. Thus, the groups appeared to be quite similar aside from the presence/absence of chronic pain. The results of the subsequent data analysis showed that

solicitous behaviours by their partners were more likely to both precede and follow the chronic pain patients' nonverbal pain behaviours. Partner solicitous behaviour was not significantly related to these nonverbal pain behaviours in couples without chronic pain.

Although there is considerable evidence of a significant relationship between pain behaviour and solicitous responding, other factors also appear to be involved. For example, Turk, Kerns, and Rosenberg (1992) examined the possibility of a moderating role of marital satisfaction in the relationships between spousal responding and pain behaviours and pain severity. This analysis provided some very interesting results. Regression models that included solicitous responding, marital satisfaction, and the interaction between the two best predicted variations in both pain behaviours and pain severity. The authors suggest that these results indicate that the reinforcing effect of spousal responding is dependent upon the patient's appraisal of this responding. For example, an offer of help by one's spouse may only serve to reinforce the prior pain behaviour if the offer is viewed in a positive light. If the individual sees the spouses' offer in a negative light, this is less likely to be a positive reinforcer of pain behaviour. Given the potential association between relationship satisfaction and solicitous responding, measures of relationship satisfaction were included in the current study as variables to be assessed.

Catastrophizing and Solicitous Responding. The CCM of pain catastrophizing suggests that the social connectedness inherent in communal coping will be evidenced in the level of solicitous responding by those in close relationship to individuals exhibiting pain behaviour. The current study examined the association between solicitous responding and levels of reported catastrophizing in close relationships as experienced by undergraduates with persistent pain. These relationships included parents/guardians,

friends, and dating partners. Although solicitous responding is generally researched in the context of spousal or significant other relationships, there is no current evidence to suggest that solicitous responding is limited to these types of relationships. In fact, researchers have begun to explore solicitous responding among other relationship types (e.g., roommate, parent, attendant; Giardino, Jensen, Turner, Ehde, & Cardenas, 2003).

It has been suggested that those individuals with high levels of catastrophizing may have an interpersonal style that encourages caretaking and support from others (Lackner & Gurtman, 2004). Research has supported this premise. For example, Keefe et al. (2003) recently conducted a study involving individuals with persistent pain due to cancers of the gastrointestinal system, as well as their caregivers. Those with greater levels of pain catastrophizing reported receiving higher levels of instrumental social support, such as assistance with daily tasks, from their caregivers.

In a study of persons with chronic pain resulting from spinal cord injury, Giardino et al. (2003) found that catastrophizing was significantly related to pain reports as well as to perceived solicitous responding. Interestingly, although the association between catastrophizing and sensory pain reports was found across all relationships, the association was stronger for those who lived with a spouse or romantic partner than it was for those who lived with someone else (e.g., attendant, roommate, parent). The authors suggest that individuals may be more likely to express catastrophizing within closer relationships. In order to examine this further, the present research explored catastrophizing and solicitousness within a variety of relationship types (i.e., parent/guardian, friend, dating partner).

Although the CCM suggests that catastrophizing is likely to be associated with perceived solicitous partner responding, research findings have been mixed. In a study of

adult chronic pain patients, Boothby, Thorn, Overduin, and Ward (2004) found that catastrophizing and perceived partner solicitous responding were independently related to pain variables and pain behaviours. Catastrophizing was not directly associated with perceived solicitous partner responses, but rather was associated with perceived punishing partner responses. As explanation for these findings, the authors suggested that catastrophizing may be a part of an overall negative cognitive set. If so, one would expect that people who catastrophize would also tend to view their partners' responding as negative. In response to the findings of this study, MacDonald (2004) proposed that these results should, in fact, be seen as supporting the CCM of pain catastrophizing. He suggested that the lack of association between catastrophizing and solicitousness may actually indicate that the individual's catastrophizing behaviour was successful in garnering social support, leading to a decrease in the catastrophizing behaviour.

Boothby et al. (2004) also suggest that catastrophizing may simply serve different purposes for individuals depending upon the specifics of their pain experience. Solicitous responding may be more common when pain is more severe or more recent. Support for this interpretation is found in a study conducted by Cano (2004). In this study, individuals with chronic pain perceived their spouses as more solicitous when their pain was of a shorter duration. However, for those with longer pain durations, catastrophizing was not related to perceived solicitous responses. Instead, catastrophizing was related to less perceived social support and greater perceived punishing responses. These findings point to the importance of acknowledging that interpersonal relationships are not static. That is, the interactions within relationships for individuals with persistent pain change, both as they spend more time together and in response to specific situational influences.

Another interesting finding of Cano (2004) is that marriage duration was not a

significant moderator of catastrophizing and perceived partner support. However, this finding is of limited utility as it is not known whether the individuals' chronic pain conditions began prior to or following the onset of the romantic relationship. The author suggests that individuals with chronic pain may seek out partners who are responsive to their pain related needs. Given these findings, the current study includes pain duration and relationship length (dating relationship and friendship) as variables for analysis.

Catastrophizing and Mental Health

A substantial amount of research has also been performed examining the potential relationships between catastrophizing and mental health. In a study involving a large Dutch community sample, catastrophizing was associated both with general health perceptions and reports of mental health problems, including feelings of depression and nervousness (Severeijns, van den Hout, Vlaeyen, & Picavet, 2002). Catastrophizing has been associated with depressive symptoms among individuals with temporomandibular disorders (Turner, Dworkin, Mancl, Huggins, & Truelove, 2001) and has been shown to be a strong predictor of depression among chronic pain patients with a variety of primary pain sites (Turner, Jensen, & Romano, 2000).

In light of findings of high correlations between catastrophizing and depression, some researchers have suggested that catastrophizing should be conceptualized as an expression of a depressive condition (Sullivan & D'Eon, 1990). Subsequent research, however, has demonstrated that, while remaining closely related, catastrophizing and depression are distinct psychological dimensions (Keefe et al., 2000; Sullivan, Rodgers, & Kirsch, 2001). The present study includes a measure of depression, as well as of catastrophizing, in order to further examine the relationship between these variables and how they relate to solicitous responding in close relationships.

Hypotheses

Based on the CCM theory of pain catastrophizing, the current study addressed the following research questions:

1. Is catastrophizing associated with greater pain severity among undergraduates with persistent pain?
2. Are higher levels of catastrophizing associated with more frequent discussions about pain with parents/guardians, dating partners, and/or friends?
3. Do those who report higher levels of catastrophizing also experience their parents/guardians, dating partners, and/or friends as more solicitous in response to their expressions of pain?

Exploring the question of whether or not catastrophizing is associated with greater pain severity among the undergraduate population provides an extension of the current understanding of the universality of pain catastrophizing. It was hypothesized that the level of pain catastrophizing would be positively associated with reported pain severity among participants.

The second research question sought to explore one of the behavioural aspects of pain catastrophizing. In particular, the verbalization of the pain experience with one's partner was expected to be an essential element in the process of communal coping. It was hypothesized that increased levels of pain catastrophizing would be associated with reports of more frequent discussions about pain with parents/guardians, friends, and dating partners.

This study also examined a potential association between catastrophizing and perceived solicitous responding from others within close relationships. Based on the CCM of pain catastrophizing and previous research findings in this area, it was expected

that catastrophizing would be a significant predictor of solicitous responses by parents/guardians, friends, and dating partners. Although very little research has been conducted in the area of solicitous responding within parent/guardian-child, friend, and dating relationships, it was expected that many of the same findings found in marriage relationships would also be observed in these relationships. It was also hypothesized that pain severity, sex of participant, sex of other (i.e., parent/guardian, friend, partner), and relationship satisfaction would be significant predictors of solicitous responding. Due to a lack of previous research within this population it was unclear as to whether level of depression would be associated with catastrophizing among undergraduates with persistent pain. Therefore, although no specific hypothesis was made regarding level of depression, this variable was included in the analysis.

Exploratory analysis was also conducted to examine differences between the three types of close relationships examined in this study. Ways in which the three components of pain catastrophizing (rumination, magnification, and helplessness) relate to the above variables was also explored.

Method

Participants

The participants in this study were university undergraduates recruited from Introductory Psychology classes at the University of Manitoba. The undergraduates received course credit for their participation. During the recruitment sessions three criteria were presented as necessary for participation in the study. Participants were required to be: (1) between 18 and 25 years old; (2) currently in an exclusive dating relationship that had been ongoing for a minimum of two months; and (3) experience persistent pain. Following a procedure similar to that used in previous research with

undergraduates (Brewer & Karoly, 1992; Karoly & Lecci, 1997), persistent pain was determined by "yes" responses to the following questions: "Do you experience troublesome pain anywhere in your body that has lasted for six months or more or pain that reoccurs on a regular basis?" and "Is your pain severe enough that it cannot be easily ignored, even though it may not interfere with your everyday activities?"

A total of 200 undergraduates completed the questionnaire. However, upon examination of the questionnaires, it was determined that 58 of the participants did not fulfill all of the criteria for inclusion. Therefore, the final analysis was completed using data from 142 participants. The participants were 93 females (66%) and 49 males (34%) and ranged in age from 18 to 25 years (mean = 20 years; SD = 2.6).

Procedure

Participants completed a questionnaire consisting of scales designed to measure the variables of interest. Two different versions of the questionnaire were administered. The order in which the scales were presented to the respondents was varied in these two versions of the questionnaire in order to control for potential order-effects. The questionnaires were administered in a group setting of approximately 60 students per session and completion of the questionnaire took approximately 30 minutes. The participants were informed that they were free to withdraw from the study at any time without loss of participation course credits. Participants signed an informed consent form prior to completion of the questionnaire (Appendix A) and when they returned their questionnaires they received a feedback form that provided specific information regarding the purposes of the study (Appendix B). The questionnaires contained an identification number and the students' names did not appear anywhere on the questionnaire. The data collected will be kept confidential and stored in a locked

laboratory office.

It should be noted that all data for this study, including measures of others' solicitous responding, was collected from the undergraduates. Although assessing parents/guardians, friends, and dating partners on their perceptions of their own responses to pain behaviour would also have been valuable, research has indicated that an individual's perception of others' responses tends to be a better predictor of pain variables (Goldberg, Kerns, & Rosenberg, 1993). In the present research, the way in which the participants perceive others' responses toward them when they are in pain is an important factor in understanding the relationship between catastrophizing and solicitous responding.

Measures

Demographic and Pain Information. The Demographic and Pain Survey (Appendix C) has been designed to collect demographic information about participants as well as information regarding their pain experience. The two questions regarding persistent pain used to recruit participants were also included in this section of the questionnaire. Only data from those participants who answered "yes" to both of these questions were included in the analysis. This survey also included questions about the duration and severity of the participants' pain.

Catastrophizing. Data on pain catastrophizing was obtained using the Pain Catastrophizing Scale (PCS; Sullivan et al., 1995). The PCS is a commonly used measure of pain catastrophizing in the research literature. The PSC is a 13-item self-report measure in which participants are asked to rate how often they experience specific thoughts and feelings during times when they are experiencing pain. Each item is rated

on a 5-point scale from 0 "not at all" to 4 "all the time". A total score, obtained by summing the responses to all 13 items, is used as a general measure of the degree of pain catastrophizing. Subscale scores can also be obtained by summing the items comprising each of the scales. The rumination subscale consists of four items, the magnification subscale consists of three items, and the helplessness subscale consists of six items.

The PCS has been shown to have high internal consistency (coefficient alphas: total PCS = 0.87, rumination = 0.87, magnification = 0.66, helplessness = 0.78; Sullivan et al., 1995). Test-retest reliability over a 6-week period has been examined and indicates that the PCS has a high degree of stability, $r = .75$, $P < .001$ (Sullivan et al.). Confirmatory factor analysis has also provided support for the rumination, magnification, and helplessness subscales of the PCS (Van Damme, Crombez, Bijttebier, Goubert, & Van Houdenhove, 2002). Criterion-related validity for the PCS has also been examined and the PCS total score was found to be useful in differentiating between pain outpatient and community participants (Osman et al., 2000).

Relationship Information and Discussion of Pain. Information about the participants' relationships was collected through a series of questions divided into three sections (Appendix D). Information about the amount of discussion about pain that the participants engage in with their parent/guardian, friend, and dating partner was also collected in each of these sections. Following each set of relationship questions, measures of solicitous responding (discussed below) were completed with regards to that particular relationship.

In the first section, participants were asked to identify the parent/guardian to whom they feel the closest and then rate how satisfied they are with their relationship. Global relationship satisfaction was measured using the question "In general, how

satisfied are you with your relationship with your parent/guardian?" This question was rated on a 5-point scale from 1 (*not at all satisfied*) to 5 (*extremely satisfied*). Information about the amount of pain discussion that the participant engages in with his/her parent/guardian was obtained through a single question. The question "How often do you discuss your pain with your parent/guardian?" was answered on a 6-point scale ranging from *never* to *daily*.

In the second section, participants were asked to think of the friend to whom they feel the closest. They then answered three questions regarding their friendship with that person. These items were: "Is the friend you are thinking of male or female?", "Approximately how long have you been friends with this person?" and "In general, how satisfied are you with your relationship with this friend?" This question was rated on the same 5-point scale used for relationship satisfaction in the first section. Participants then answered the question regarding discussion of pain as in the previous section.

Finally, in the third section, participants were asked to complete a series of items about their current dating relationship. These questions include: "Is your current dating partner male or female?", "Approximately how long have you been in an exclusive dating relationship with your current dating partner?", and "In general, how satisfied are you with your relationship with your current dating partner?" Again, the question regarding relationship satisfaction was rated on a 5-point scale ranging from 1 (*not at all satisfied*) to 5 (*extremely satisfied*). The question "How often do you discuss your pain with your current dating partner?" was also included in this section.

Solicitous Responding. Solicitous responding was measured using Part II of the West Haven-Yale Multidimensional Pain Inventory (WHYMPI; Kerns, Turk, & Rudy, 1985). The WHYMPI is a self-report measure designed to assess various aspects of the

chronic pain experience. Part II of the WHYMPI assesses the perceived responses of significant others to the respondent's pain behaviour. This scale consists of three subscales: punishing, distracting, and solicitous responses.

Part II of the WHYMPI consists of 14 items in which respondents are asked to rate how often their significant other responds to them in a particular way when they are in pain. Each item is rated on a 7-point scale ranging from 0 (*never*) to 6 (*very often*). Although all 14 items of the scale will be administered to the participants, only the solicitous subscale will be used for the current analysis. Participants responded to the 14 questions for each of three relationships examined: parent/guardian, friend, and dating partner. The subscale scores are calculated by averaging the responses to the items in that subscale. The solicitous subscale consists of six items.

The internal consistency of the subscales of the WHYMPI is very good. Cronbach's alpha of .78 has been found for the solicitous subscale (Kerns et al.). Test-retest reliability for the solicitous subscale has also been found to be very good with a correlation of $r = .89$, $P < .05$ between measures taken 2 weeks apart.

Although Part II of the WHYMPI was designed to assess perceived responding by spouses or significant others, the present research used this measure for perceived parent/guardian, friend, and dating partner responding. Due to the lack of research in this area, no scales of perceived responding specific to these relationships have yet been developed. However, Part II of the WHYMPI has been used to measure perceived responding in relationships other than spousal/significant other relationships. For example, in a recent study conducted by Giardino et al. (2003) the WHYMPI Solicitous Scale was used to measure perceived solicitous responding by housemates of individuals with chronic pain. The relationships between these individuals and their housemates

included a wide variety of relationship types (e.g., spouse, parent, attendant, friend). It is expected that those perceived responses to pain behaviour that are observed within marital relationships are also present to some extent within parent/guardian-child, friend, and dating relationships.

Depression. Level of depression was measured using the Center for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1977; Appendix E). The CES-D was originally designed for use in epidemiological research in measuring depression among the general population. However, since its inception the CES-D has been found useful in measuring depression in a variety of research and clinical applications (Plutchik & Conte, 1989). Notably, the CES-D has been found to be useful in assessing depression in a chronic pain population (Turk & Okifuji, 1994; Geisser, Roth, & Robinson, 1997). The internal consistency of the CES-D has been found to be very good with coefficient alpha ranging from .84 to .90 as well as moderate test-retest reliability of $r = .67$ (Radloff, 1977).

The CES-D consists of 20 items, each of which is rated on a 4-point scale for the frequency of depressive symptoms during the past week. Responses to the items range from 0 [*rarely or none of the time (Less than 1 day)]* to 3 [*most or all of the time (5-7 days*)]. Four of the items on the CES-D are positive statements which are reversed-scored (items 4, 8, 12, and 16) prior to calculating the total score. A total score for the CES-D is obtained by summing the responses of all of the 20 items with possible scores ranging from 0 to 60. Higher scores on the CES-D indicate greater frequency of depressive symptoms.

Additional Questions. Finally, two general questions were asked of the participants in order to collect qualitative data regarding catastrophizing and social

support (Appendix F). These questions were designed to obtain general information that may be helpful in developing future research studies and were not included in the current analysis.

Data Analysis

Means and standard deviations were computed in order to obtain descriptive information about each of the variables. Pearson product-moment correlational analysis was then used to examine the hypothesis that higher levels of catastrophizing would be associated with greater pain severity. Correlational analysis was also conducted in order to examine the relationship between the frequency of pain discussion and the level of catastrophizing within each of the relationship types (i.e., parent/guardian, dating partner, and friend).

Hierarchical regression analysis was then conducted in order to predict solicitous responding. A separate regression analysis was performed for parent/guardian, friend, and dating partner solicitous responding. A rule-of-thumb for determining the sample size required to detect a medium effect size in multiple regression analysis is $N = 50 + 8m$, where N is the sample size and m is the number of predictors (Green, 1991). For the present study, the greatest number of predictor variables included in any one regression analysis was eight variables. Therefore, the sample size of 142 participants ensured adequate power for the regression analyses.

In the first analysis, parent/guardian solicitous responding was the dependent variable. In Step 1, the sex of both the participant and the chosen parent/guardian were entered as well as pain severity and pain duration (sex variables were dummy coded: 0 = male, 1 = female). In Step 2, the level of satisfaction with their relationship with their parent/guardian was entered. In Step 3, the level of depression derived from the CES-D

was entered and finally, in Step 4 the level of catastrophizing was entered as a predictor.

For the second regression analysis, the dependent variable was friend solicitous responding. A similar sequence of steps as in the previous analysis was performed. However, in addition to relationship satisfaction, the length of the relationship was added as a predictor variable in Step 2.

The third regression analysis examined dating partner solicitous responding as the dependent variable. Again, the steps of the analysis were similar to the previous regression analyses. In this case, the sex of the partner was not included in the analysis as all of the participants reported that their dating partner was of the opposite sex.

Finally, exploratory analysis of the correlations between scores on the three components of pain catastrophizing (rumination, magnification, and helplessness) and solicitous responding was also conducted.

Results

Pain Variables

Seventy-three (51%) of the 142 participants reported a history of prescription pain medication use and 42 (30%) reported that they had been treated at a pain clinic at some point in their lives. In addition, 35 (25%) of the participants reported that they were currently taking medication for pain relief. Table 1 summarizes the participants' reported pain duration and the body locations in which they experience persistent pain.

Catastrophizing and Pain Severity

Descriptive statistics of the participants' responses to the PCS total and subscales are presented in Table 2. Pain catastrophizing, as measured by the total score of the PCS, was found to be significantly related to pain severity ($r = 0.452$, $P < 0.001$).

Catastrophizing and Pain Discussion

Catastrophizing was found to be positively related to the frequency of pain discussions with dating partners ($r = 0.179$, $P < 0.05$) and parents/guardians ($r = 0.213$, $P < 0.01$). However, it was not significantly related to the frequency of pain discussion with friends ($r = 0.097$, $P > 0.1$).

Perceived Solicitous Responding

Descriptive statistics of the participants' responses to the WHYMPI solicitous responding subscale for each of the relationship types are presented in Table 2. Analysis of these responses revealed that compared to men, women perceived greater solicitous behaviour from their dating partners [t (140) = -2.760, $P < 0.01$] and friends [t (140) = -3.404, $P < 0.001$]. No significant difference was found between genders for perceived parent solicitous responding [t (140) = -1.473, $P > 0.1$].

Depression

Level of depression (see Table 2) was found to be positively related to catastrophizing ($r = 0.323$, $P < 0.001$). Given this relationship depression was included in all of the regression analyses to determine the variance in solicitous responding predicted by catastrophizing beyond that predicted by the level of depression.

Regression Analyses

Parent/guardian solicitous responding. The final regression model predicting parent/guardian solicitous responding was significantly different from zero, F (7, 130) = 2.225, $P < 0.05$. The model accounted for 11% of the variability in perceived parent/guardian solicitous responding (Table 3). Relationship satisfaction was the only variable to contribute significantly to the prediction of solicitous responding ($t = 2.626$, $P = 0.01$). The more satisfied the participants were with the relationship, the higher they

rated their parents as responding to them in a solicitous manner.

Friend solicitous responding. The final model predicting friend solicitous responding was not significantly different from zero, F (8, 132) = .875, $P > 0.05$. The only variable to contribute significantly to the model was the sex of the participant (t = 2.660, $P < 0.01$). Women rated their friends higher on the measure of solicitous responding than did men (Table 4).

Dating partner solicitous responding. A summary of the results of the hierarchical regression analysis predicting dating partner solicitous responding is presented in Table 5. The final model was significantly different from zero [F (7, 133) = 8.270, $P < 0.001$] and accounted for 30% of the variance in perceived solicitous responding by dating partners. The addition of the variables in Step 1 accounted for 10% of the variance in solicitous responding. The sex of the participant contributed significantly to the model (t = 2.490, $P < 0.05$) with females rating their dating partner as more solicitous than males. Pain severity also contributed significantly (t = 2.207, $P < 0.05$). The greater the severity of the pain, the higher the ratings of dating partner solicitous responding.

In the second step, the addition of relationship satisfaction to the model increased the prediction of solicitous responding by 17%. Relationship satisfaction reached significance (t = 5.204, $P < 0.01$), with greater relationship satisfaction predicting higher ratings of solicitous responding. The inclusion of level of depression in the model did not contribute significantly.

Finally, in Step 4 catastrophizing was added to the model. Catastrophizing was a significant predictor of solicitous responding (t = 2.021, $P < 0.05$) even after the inclusion of all of the other predictors. The model including catastrophizing accounted for 30% of the variability in solicitous responding.

Subscales of the PCS

Exploratory analysis of the correlations between the three subscales of the PCS and solicitous responding was also conducted. Significant, positive correlations were found between solicitous responding and each of the three subscales: rumination ($r = 0.239$, $P < 0.005$), magnification ($r = 0.191$, $P < 0.05$), and helplessness ($r = 0.238$, $P < 0.005$). However, none of the subscale scores was associated with parent/guardian or friend solicitous responding.

Discussion

The aim of the current study was to examine the role of catastrophizing in the pain experience of undergraduates with persistent pain based on the communal coping model of catastrophizing. The first hypothesis, that catastrophizing would be positively related to pain severity, was confirmed. These findings are consistent with those of previous research (e.g., Rosenstiel & Keefe, 1983; Sullivan & Neish, 1999) and extend the scope of support for this relationship to include undergraduates with persistent pain.

It was also hypothesized that the level of pain catastrophizing would be positively associated with reports of more frequent discussions about pain with parents/guardians, friends, and dating partners. Interestingly, catastrophizing was not significantly related to the frequency of pain discussion with friends but was positively related to pain discussion with dating partners and parents/guardians. These findings provide a valuable step in exploring the types of behaviours associated with pain catastrophizing. The discovery of a relationship between catastrophizing and pain discussion in two of the three types of close relationships suggests that the communication of pain through verbal discussion may be an important expressive element of catastrophizing. The finding of a relationship between these variables with parents/guardians and dating partners but not with friends is

also consistent with the study by Giardino et al. (2003) which suggests that individuals may be more likely to express catastrophizing within closer relationships. Given recent findings that written disclosure of thoughts regarding a pain experience provided a benefit for catastrophizers in terms of pain severity (Sullivan & Neish, 1999), this area of inquiry may have important clinical applications. Perhaps engaging in certain types of discussions about pain will prove to be a helpful coping strategy for individuals who have a tendency to catastrophize. Future research examining the frequency with which individuals discuss their pain within their close relationships and the content of these conversations will be helpful in exploring this potential communicative aspect of catastrophizing.

Previous research has suggested that those individuals with high levels of catastrophizing may have an interpersonal style that encourages caretaking and support from others (Lackner & Gurtman, 2004). Based on the CCM of pain catastrophizing it was hypothesized that catastrophizing would be a significant predictor of solicitous responding within the three types of close relationships. Regression analyses were performed to test these predictions. Interestingly, catastrophizing was only found to be a significant predictor of solicitous responding within the dating partner relationship. The reason that this relationship was not found for parent/guardian and friend solicitous responding is unclear. One possibility is that catastrophizing may be less likely to be expressed in these types of relationships. For example, individuals may be less likely to spend time with their friends when they are in pain. Therefore, they would be less likely to exhibit those behaviours associated with pain catastrophizing when in the company of their friends. It is also possible that expressions of catastrophizing are more likely to elicit care-giving behaviour within romantic relationships. Perhaps there is greater

reinforcement of solicitous responding for dating partners than for friends or parents. It may also be more socially acceptable for dating partners to respond to behaviours associated with catastrophizing in a solicitous manner whereas parents or friends may be "expected" to respond differently to these behaviours.

An alternative explanation might be that there are differences in the expression of solicitous responding within these types of relationships that were not represented in the measures used in this study. The present study was limited to the use of the WHYMPI solicitous subscale which was originally designed specifically for spouse/significant other responding. It is possible that this scale does not adequately measure solicitous responding in other types of close relationships such as parent-child relationships and friendships. An examination of the utility of this scale in the measurement of solicitous responding in other close relationships is necessary in order to more fully understand these findings.

It was also hypothesized that sex would be a significant predictor of solicitous responding. Interestingly, sex was a significant predictor of friend and dating partner solicitous responding but not for parent/guardian solicitous responding. Where women reported their friends and dating partners as more solicitous than did men, there was no significant difference between the sexes in the rating of parent/guardian solicitous responding. Sex differences in the relationships between solicitous responding and pain variables have been observed in previous research involving spousal relationships (Fillingim, Doleys, Edwards, & Lowery, 2003). However, the present findings suggest that these differences may not hold for all types of relationships. Perhaps men express their pain differently with their dating partner and friends than with their parents/guardians. These different behaviours may be less likely to encourage solicitous

responding. It is also possible that parents/guardians are just as likely to act in a solicitous manner with their sons as with their daughters regardless of how they act when they are in pain. Further research investigating this gender difference may be helpful in better understanding the role of social support in the pain experience for men and women. The sex of the other (i.e., parent/guardian, friend, partner) was not a significant predictor in any of the regression analyses.

Relationship satisfaction was also included in the regression analyses and was found to be a significant predictor of both parent/guardian and dating partner solicitous responding. In fact, relationship satisfaction was the only significant predictor in the regression model of parent/guardian solicitous responding. These results are support the findings of Turk, et al. (1992) that marital satisfaction played a moderating role in the relationships between spousal responding and pain behaviours and pain severity. These results indicate that individuals' perceptions of the way others respond to them when they are in pain are at least somewhat dependent upon their appraisal of their relationship with that person.

Pain severity, pain duration, and relationship duration were also included in the analyses in order to control for the effects that they may have on solicitous responding. The only case in which any of these variables was a significant predictor was pain severity in predicting dating partner solicitous responding. The greater the pain severity, the higher the participant's rating of his/her dating partner's solicitous responding.

Although depression was significantly related to catastrophizing it did not contribute significantly to any of the regression models of solicitous responding. No hypothesis had been made regarding depression as it was unclear as to what level depression would be a factor for undergraduates with persistent pain.

Finally, ways in which the three components of pain catastrophizing (rumination, magnification, and helplessness) related to solicitous responding were also explored. All three of the subscales were positively related to dating partner solicitous responding. It appears that each of the components of catastrophizing plays a role in this relationship with no one scale appearing to be more important than the others. There were no significant correlations between parent or friend solicitous responding and any of the catastrophizing subscales.

It should be noted that there are a number of limitations to this study. The data used in this analysis was retrospective and solely gathered from self-report of the undergraduates with persistent pain. Therefore, whether these reported behaviours reflect the actual behaviour of the participants or that of their parents/guardians, friends, and dating partners is unknown. Although the participant's perception of the solicitous responding by others provides valuable information, direct observational data of these behaviours in future research is needed. Another limitation of this study is that this research is correlational and so it is impossible to determine whether there is a causal relationship between the variables. Finally, participants in this research were limited to undergraduates with persistent pain. Therefore, it is unclear as to whether these findings can be generalized to include other populations.

In conclusion, this study offers at least partial support to the communal coping model of pain catastrophizing. In particular, the association between the level of catastrophizing and the frequency of discussion about pain in close relationships suggests that catastrophizing may be verbally expressed within these relationships. In addition, catastrophizing was found to be a significant predictor of dating partner solicitous responding even when controlling for a wide variety of demographic, pain, and

relationship variables. This suggests that, at least within the romantic relationships of undergraduates with persistent pain, catastrophizing may serve as a means of eliciting support in coping with pain.

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Appendix A

Consent Form

Researcher: Tiffany Scott, B. A., Graduate Student

Faculty advisor: Dr. Michael Thomas, Ph.D., C. Psych.

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

You are invited to participate in a research study conducted by Tiffany Scott, a M.A. student from the Psychology Department of the University of Manitoba. In this study, you will be asked to provide personal information, information about the pain that you experience on a regular basis, as well as information about your relationships with your parents/guardians, friends, and dating partner.

It should take approximately 45-60 minutes to complete the questionnaire. You will receive 2 course credits for your participation. If you become uncomfortable at any time, you are free to end your participation without loss of course credits.

Please do not write your name anywhere on the questionnaire. There will be no identifying information on the questionnaires and individual results will be kept strictly confidential. The results of this study will only be presented as group data (e.g., mean score). The questionnaires will be kept in a locked laboratory office and will be viewed only by laboratory researchers. The results of this study will be used in a M.A. thesis paper, and may be referred to in journal articles and presentations at psychological conferences.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

Tiffany Scott, B.A., Graduate Student: *(leave message)*

Or you may contact the faculty advisor of the project, Dr. Michael Thomas: 474-9633

This research has been approved by the Psychology/Sociology Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 474-7122, or e-mail margaret_bowman@umanitoba.ca. A copy of this consent form has been given to you to keep for your records and reference.

_____

Participant's Signature Date

_____

Researcher and/or Delegate's Signature Date

If you wish to receive a summary of the study's result, please provide your email or mailing address as of June, 2005. If not, please do not provide your address.

Email or Mailing Address (if interested in receiving summary of results):

_____

Appendix B

Persistent Pain and Social Relationships: Feedback Form

The purpose of this study is to better understand a number of aspects of the pain experience for undergraduates who experience persistent pain.

First, we are interested in exploring the possible connection between the level to which people catastrophize about their pain and the severity of their pain. Pain catastrophizing has been defined as "an individual's tendency to focus on and exaggerate the threat value of painful stimuli and negatively evaluate one's own ability to deal with pain' (Keefe et al., 2000, p. 326). Based on previous research findings, we expect those with higher levels of pain catastrophizing will also report higher levels of pain severity.

The communal coping model (CCM) of pain catastrophizing proposed by Sullivan, Tripp, and Santor (2000) suggests that catastrophizing may be a way in which people express their pain to those around them in order to help them cope with the pain. In support of this model, research had found that pain catastrophizing is associated with greater perceived solicitous responding by significant others (Giardino, Jensen, Turner, Ehde, & Cardenas, 2003). Solicitous responding refers to statements of concern about the individual's pain, offers of assistance, or direct physical assistance (Newton-John, 2002).

Based on the CCM of pain catastrophizing, it is hypothesized that in the current research higher levels of pain catastrophizing will be associated with reports of more frequent discussions about pain. It is also hypothesized that catastrophizing will be a significant predictor of perceived solicitous responding by parents/guardians, friends, and dating partners. Pain severity, sex of participant, sex of other (i.e., parent/guardian, friend, partner), and relationship length, and relationships satisfaction are also hypothesized to be significant predictors of solicitous responding.

It is our hope that this research study will provide valuable information about the persistent pain experienced by undergraduates as well as some of the ways in which this pain interacts with their social environment.

We would like to thank you for participating in our study. The results will be available in June, 2005 and the strictest of measures shall be taken to maintain confidentiality. Also, please note that help and counselling is available for you at the Peer Advisor's office in 150 University Centre (474-6696), at the Counselling Centre (474-8592) or at the Psychological Service Centre (474-9222).

If you have any further questions or concerns, please contact Dr. Michael Thomas at 474-9633. We would ask that you do not discuss this study with persons in your class or from other sections of the introductory psychology course, as they may be potential participants in the future.

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Appendix C

Demographic and Pain Survey

Code No.___

1. Age: _____

2. Sex: a) male b) female

3. Marital Status: a) single b) married c) separated

d) divorced e) widowed f) common-law

4. Do you experience troublesome pain anywhere in your body that has lasted for 6 months or more or pain that reoccurs on a regular basis? Yes No

If YES, for approximately how long have you been experiencing this pain? (check ☑)

- ☐ 6-11 months
- ☐ 1-2 years
- ☐ 3-5 years
- ☐ 5-10 years
- ☐ More than 10 years

5. What type of persistent pain do you experience?

- ☐ headache
- ☐ stomach pain
- ☐ neck pain
- ☐ joint pain
- ☐ back pain
- ☐ muscle pain
- ☐ other (please specify)_____

6. Is your pain severe enough that it cannot be easily ignored, even though it may not interfere with your everyday activities? Yes No

7. If **10** is the worst pain you have ever experienced and **0** is no pain, what is the typical severity of your persistent pain (circle):

0 1 2 3 4 5 6 7 8 9 10

8. Have you ever been prescribed medication to relieve pain? Yes No

9. Do you currently take medication to relieve pain? Yes No

10. Have you ever been treated at a pain clinic? Yes No

Appendix D

Relationship Information and Discussion of Pain Questionnaire

Part I

Please think of the parent/guardian with whom you feel the closest and answer the following questions about your relationship with that parent/guardian.

1. Please identify which parent/guardian you will be answering the following questions about (check ☑):

   ☐ Mother/Stepmother ☐ Father/Stepfather ☐ Other guardian: ☐Male ☐Female

2. In general, how satisfied are you with your relationship with your parent/guardian? (circle number)

   1 2 3 4 5

   Not at all satisfied Extremely satisfied

3. Approximately how often do you discuss your pain with your parent/guardian? (check ☑)

   ☐ Never
   ☐ A few times a year
   ☐ About monthly
   ☐ About weekly
   ☐ 3-4 times a week
   ☐ Daily

Part II

Please think of the friend with whom you feel the closest (**other than your current dating partner**) and answer the following questions about that friend/relationship.

1. Is the friend you are thinking of male or female? (check ☑)

   ☐ Male

   ☐ Female

2. Approximately how long have you been friends with this person? (check ☑)

   ☐ Less than one month

   ☐ 1-6 months

   ☐ 7-11 months

   ☐ 1-2 years

   ☐ 3-5 years

   ☐ More than 5 years

3. In general, how satisfied are you with your relationship with this friend? (circle number)

   1 2 3 4 5

   Not at all satisfied Extremely satisfied

4. Approximately how often do you discuss your pain with this friend? (check ☑)

   ☐ Never

   ☐ A few times a year

   ☐ About monthly

   ☐ About weekly

   ☐ 3-4 times a week

   ☐ Daily

Part III

Please answer the following questions about your current dating partner.

1. Is your current dating partner male or female? (check ☑)

   ☐ Male

   ☐ Female

2. Approximately how long have you been in an exclusive dating relationship with your current dating partner? (check ☑)

   ☐ Less than one month

   ☐ 1-6 months

   ☐ 7-11 months

   ☐ 1-2 years

   ☐ 3-5 years

   ☐ More than 5 years

3. In general, how satisfied are you with your relationship with your current dating partner? (circle number)

   1 2 3 4 5

   Not at all satisfied Extremely satisfied

4. Approximately how often do you discuss your pain with your current dating partner? (check ☑)

   ☐ Never

   ☐ A few times a year

   ☐ About monthly

   ☐ About weekly

   ☐ 3-4 times a week

   ☐ Daily

Appendix E

Center for Epidemiologic Studies Depression Scale (CES-D), NIMH

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

	During the Past Week			
	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all of the time (5-7 days)
1. I was bothered by things that usually don't bother me.	0	1	2	3
2. I did not feel like eating; my appetite was poor.	0	1	2	3
3. I felt that I could not shake off the blues even with help from my family or friends.	0	1	2	3
4. I felt I was just as good as other people.	0	1	2	3
5. I had trouble keeping my mind on what I was doing.	0	1	2	3
6. I felt depressed.	0	1	2	3
7. I felt that everything I did was an effort.	0	1	2	3
8. I felt hopeful about the	0	1	2	3

future.				
9. I thought my life had been a failure.	0	1	2	3
10. I felt fearful.	0	1	2	3
11. My sleep was restless.	0	1	2	3
12. I was happy.	0	1	2	3
13. I talked less than usual.	0	1	2	3
14. I felt lonely.	0	1	2	3
15. People were unfriendly.	0	1	2	3
16. I enjoyed life.	0	1	2	3
17. I had crying spells.	0	1	2	3
18. I felt sad.	0	1	2	3
19. I felt that people dislike me.	0	1	2	3
20. I could not get "going."	0	1	2	3

Appendix F

Have you ever felt that your pain was more than you could handle? Yes No

Please describe what this was like for you: _____

_____

_____

_____

_____

Did you receive help from someone in dealing with your pain? Yes No

Please describe the type of help you received and how you felt about this help:

_____

_____

_____

_____

_____

Table 1

Descriptive Analyses of Pain Duration and Location

	n	%
Pain Duration[a]		
6 - 12 months	44	31
1 - 2 years	49	35
3 - 5 years	26	18
5 - 10 years	16	11
>10 years	6	4
Pain Location[b]		
Back pain	53	37
Headache	40	28
Joint pain	33	23
Stomach pain	24	17
Muscle pain	21	15
Neck pain	13	9
Other pain	14	10

Note. [a] $n = 141$. [b] $n = 142$. Some respondents identified multiple pain locations.

Table 2

Descriptive Analyses for Measures of Catastrophizing, Solicitousness, and Depression

Measure	Possible range	Sample's range	Mean (SD)
PCS			
Catastrophizing Total	0-52	0-51	21.7 (10.0)
Rumination	0-16	0-16	7.9 (3.9)
Magnification	0-12	0-12	4.7 (2.5)
Helplessness	0-24	0-23	9.2 (5.1)
WHYMPI Solicitousness			
Parent/guardian	0-6	0-6	3.3 (1.4)
Friend	0-6	0-6	2.8 (1.5)
Dating Partner	0-6	0-6	3.5 (1.5)
CES-Depression	0-60	3-45	19.8 (10.2)

Note. PCS =Pain Catastrophizing Scale; WHYMPI = West Haven-Yale Multidimensional Pain Inventory; CES-Depression = Center for Epidemiological Studies-Depression Scale.

Table 3

Hierarchical Regression Analysis for Variables Predicting Parent/Guardian Solicitous Responding (N = 142)

Step	Variable	*Beta*	Total R^2	R^2 Change	*F*-Change
1			0.05	0.05	1.735
	Sex	.107			
	Parent/guardian sex	.160			
	Pain severity	.069			
	Pain duration	-.009			
2			0.090	0.040	5.851*
	Relationship satisfaction	.223**			
3			0.098	0.008	1.146
	Depression	.094			
4			0.107	.009	1.335
	Catastrophizing	.115			

Note. R^2 and *F*-change values are for each set of variables.

* $p \leq 0.05$. ** $p \leq 0.01$.

Table 4

Hierarchical Regression Analysis for Variables Predicting Friend Solicitous Responding (N = 142)

Step	Variable	*Beta*	Total R^2	R^2 Change	*F*-Change
1			0.092	.092**	3.429
	Sex	.288**			
	Friend sex	-.053			
	Pain severity	.105			
	Pain duration	-.087			
2			.100	.008	.593
	Relationship satisfaction	.071			
	Relationship duration	-.078			
3			.101	.001	.195
	Depression	.038			
4			.102	.001	.166
	Catastrophizing	.041			

Note. R^2 and *F*-change values are for each set of variables.

** $p \leq 0.01$.

Table 5

Hierarchical Regression Analysis for Variables Predicting Dating Partner Solicitous Responding (N = 142)

Step	Variable	*Beta*	Total R^2	R^2 Change	*F*-Change
1			0.099	.099	5.020**
	Sex	.203*			
	Pain severity	.180*			
	Pain duration	.140			
2			.267	.168	15.503**
	Relationship satisfaction	.435**			
	Relationship duration	.066			
3			.282	.015	2.718
	Depression	.133			
4			.303	.021	4.083*
	Catastrophizing	.175*			

Note. R^2 and *F*-change values are for each set of variables.

* $p \leq 0.05$. ** $p \leq 0.01$.