The Nature and Extent of Social Anxiety and Avoidance in Patients with Chronic Pain

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Abstract

The present study explored the nature and extent of social anxiety and avoidance in 46 clinic-referred chronic pain patients relative to a community-based group reporting pain (n = 66) and healthy controls (n = 57). These social fears were also investigated in relation to anxiety sensitivity (i.e., the propensity to fear anxiety-related somatic sensations; Reiss & McNally, 1985) and the elevated pain-related anxiety and avoidance commonly reported by patients with chronic pain. The clinic-referred chronic pain patients consistently reported higher social distress, social avoidance, and fear of negative evaluation as compared with controls. As expected, the clinic-referred chronic pain patients also reported higher levels of anxiety sensitivity and pain-related anxiety and avoidance as compared with controls. With the exception of cognitive anxiety about pain and fear of cognitive and emotional dyscontrol, these group differences disappeared when pain severity was controlled for. The social distress, social avoidance, and fear of negative evaluation reported by the clinic-referred chronic pain patients was consistently related to cognitive anxiety about pain, but not with other measures of pain-related anxiety or avoidance. As anticipated, anxiety sensitivity was strongly related to both social and pain-related fears. In relation to the present results, the potential source of these social fears and the possible role that negative affect and depression might have in the development of social anxiety and avoidance in chronic pain patients is discussed.

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Introduction

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The intractable nature of chronic pain - that it persists in the absence of any apparent organic pathology (Wall, 1979) - has frustrated and perplexed researchers and clinicians alike. It is the inconsistency between the behavioural indicators and organic/sensory components of pain that has prompted extensive investigation into the role that psychological factors play in the pain experience (e.g., Fordyce, 1976; Vlaeyen, Kole-Snijders, Boeren, & van Eek, 1995; Vlaeyen, Kole-Snijders, Rotteveel, Ruesink, & Heuts, 1995). More specifically, explanations of exaggerated or persistent pain have focused on the role that fear of pain and pain-related avoidance play in the maintenance of the chronic pain syndrome.

Fear of pain

There has been considerable investigation into the extent to which chronic pain patients fear (e.g., McCracken, Zayfert, & Gross, 1992, 1993; McCracken, Gross, Sorg, & Edmands, 1993; Vlaeyen et al., 1995a,b) and avoid (e.g., Asmundson, Norton, & Norton, 1999; Waddell, Newton, Henderson, Somerville, & Main, 1993) certain activities that are related to the experience of pain (e.g., movement, physical activity, recreational activity, work). These investigations stem from theoretical approaches suggesting that pain chronicity may be developed and

maintained by the reinforcing effects achieved through avoidance of pain related stimuli (Fordyce, 1976; Fordyce, Shelton, & Dundore, 1982; Lethem, Slade, Troup, & Bentley, 1983; Philips, 1987; Vlaeyen et al., 1995a). Avoidance is initially an adaptive response that serves to resolve acute injury (Wall, 1979). However, as Lethem et al. (1983) point out, behavioural indicators of pain can become desynchronous with the organic/sensory component of pain. In other words, verbal complaints of pain, reduced activity, and other observable expressions of pain can increase, decrease, or in fact remain stable, independent of changes in tissue damage. This is true for approximately 10% of adults who sustain musculoskeletal injury: their experience of pain persists long after any identifiable organic pathology has healed (Waddell, 1987). For some of these individuals, as tissue injury remits and fear remains, pain behaviours are no longer elicited by an internal sensory stimulus but rather become largely avoidance responses maintained by subsequent reduction in emotional distress (McCracken et al., 1992). Persistent avoidance behaviour, continuing well after the damaged tissue has healed, is viewed as a maladaptive response that may contribute to disability (e.g., through the "disuse syndrome"; Bortz, 1984), physical deconditioning, dysphoric affect, and preoccupation with somatic symptoms (Asmundson et al., 1999a).

Accordingly, the fear-avoidance model has provided a promising account of how chronic pain may develop in the light of the apparently 'healed' acute injury. Fear-avoidance refers to the avoidance of movement or activities, which is primarily based on the fear of pain and (re)injury. Avoidance learning occurs when the undesirable event has been successfully avoided by the performance of a particular

(avoidance) behaviour. Fordyce (Fordyce, 1976; Fordyce et al., 1982) originally described how individuals learn that avoidance of pain-provoking and pain-increasing situations reduces the likelihood of new pain episodes. Subsequently, Lethem and colleagues (1983) described a model explaining how fear of pain and avoidance of the pain experience and painful activities – arising essentially from an innate drive to reduce pain and suffering – leads to the perpetuation of pain and pain-related behaviours (e.g., disuse, disability, and avoidance itself). Concurrent with the so-called 'cognitive revolution' in behavioural science, Philips (1987) argued in favour of a cognitive approach to avoidance behaviour rather than a purely instrumental or behavioural one. Philips describes avoidance as determined by a preference for minimising discomfort and pain, in addition to thoughts and beliefs (including expectancies, feelings of self-efficacy, and memories of past exposures) that re-exposure to certain experiences or activities will produce both pain and suffering. Both the 'instrumental' and the 'cognitive' approach have lead to influential fear-avoidance models that attempt to explain how pain behaviours can be maintained in chronic musculoskeletal pain (Vlaeyen & Linton, 2000).

The fear-avoidance model

Vlaeyen and colleagues (Vlaeyen & Linton, 2000; Vlaeyen et al., 1995a,b) have since proposed an amalgamation of the aforementioned models. The fear-avoidance model (see Figure 1.) proposed by Vlaeyen et al. is intended to serve as a heuristic aid and links together several findings in recent literature concerning the

role of fear-avoidance in the development of musculoskeletal pain problems. They hypothesise that pain-related fear may lead to disability in a number of ways:

(1) Research (e.g., Burton, Tillotson, Main, & Hollis, 1995; McCracken et al., 1992) suggests that negative appraisals or catastrophic thinking about pain and its consequences exacerbates a fear of pain, and since:

(2) Fear is typically characterised by escape and avoidance behaviours, deliberate avoidance of everyday activities that are expected to produce pain is the common outcome.

(3) Given that avoidance is considered to be the result of the anticipation of pain rather than as a response to pain, these behaviours are maintained by the avoidance itself as fewer opportunities to correct the exaggerated expectancies and beliefs about pain arise.

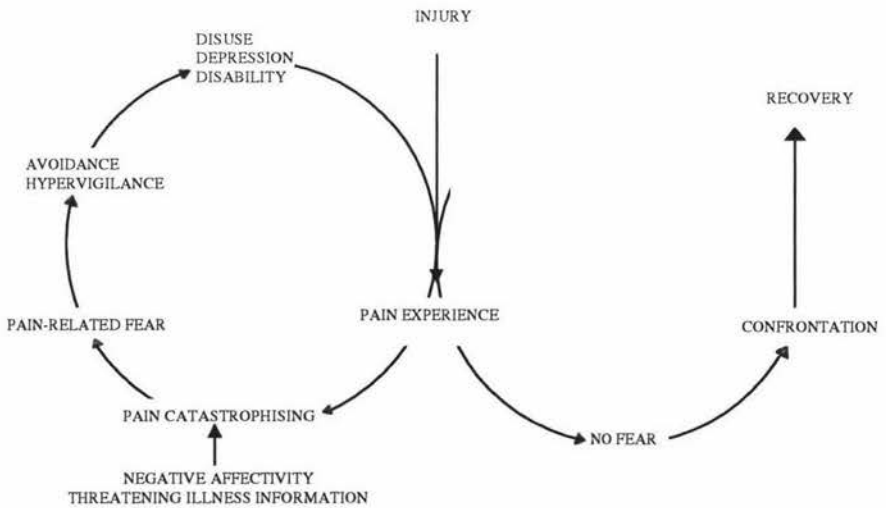

Figure 1. The fear-avoidance model (Vlaeyen & Linton, 2000, p.329)[1].

[1] Reprinted with kind permission from Johan W.S. Vlaeyen.

(4) Pervasive and chronic avoidance and physical inactivity has a detrimental impact on the cardiovascular and musculoskeletal systems (Kottke, 1996), leading to the 'disuse' syndrome (Bortz, 1984), which may further exacerbate the pain problem. Depression and other mood disturbances frequently found in those experiencing chronic pain may be the result of a withdrawal of reinforcers (Vlaeyen & Linton, 2000). Furthermore, depression and disuse are known to be associated with decreased pain tolerance (Romano & Turner, 1985) and therefore they may promote the painful experience.

Further predictions can be derived from this fear-avoidance model from a cognitive-behavioural perspective.

(5) Pain-related fear interferes with cognitive functioning in the same way as other fear and anxiety, and serves to increase attention toward possible signs of threat. This hypervigilence also means that the individual will be less able to shift their attention from pain-related information, which may be at the expense of other daily tasks (Vlaeyen & Linton, 2000). Anxiety about pain also functions to distort cognitions involved in the prediction or expectation of pain.

(6) Fear of pain is likely to be coupled with increased physiological reactivity when the patient is confronted with situations that are appraised as dangerous.

The model proposes that if a pain is interpreted as threatening (pain catastrophising) pain-related fear evolves. Avoidance behaviours and hypervigilence

to bodily sensations follow this developing fear and often results in disuse, disability, and depression. The latter will maintain the pain experiences and in this manner promotes the vicious cycle of increasing fear and avoidance (Vlaeyen & Linton, 2000). Non-catastrophising patients fail to develop the debilitating pain-related fear and as a consequence rapid confrontation with daily activities is more likely to occur, leading to fast recovery. Fear-avoidance has since been regarded as a central mechanism in the development of long term back problems and is thought to play an instrumental role in the so-called disuse or deconditioning syndrome.

Research on pain-related fear and avoidance

There is an expanding body of research documenting the impact that fear of pain has on the individual in terms of their development of maladaptive avoidance behaviour and further disability. Although chronic pain in itself cannot always be avoided, the activities assumed to increase pain or (re)injury can be. As such, daily activity levels decrease, potentially resulting in functional incapacity. Philips and Jahanshahi (1985) demonstrated that when chronic pain patients were exposed to an aversive stimulus, avoidance lead to increased sensitivity to the pain stimulus and increased avoidance on subsequent trials. In addition, a number of studies have investigated the impact of pain-related fear and physical performance. For example, the results of a study by Crombez, Vlaeyen, Heuts and Lysens (1999) suggest that pain-related fear is associated with escape/avoidance of physical activities that result in poor behavioural performance. Specifically, pain-related fear was found to be the

best predictor of behavioural performance in a trunk extension-flexion and weight lifting task, even after partialling out the effects of pain intensity.

The impact of pain-related fear can also be seen in daily activities and the development of disability. Research suggests that self-reported disability in activities of daily living (and work loss) is dependent, not only on pain severity, but also on psychological distress and pain avoidance behaviours (Waddell et al., 1993). Vlaeyen et al. (1995b), using linear regression, found that fear of movement/(re)injury is a better predictor of self-reported disability levels as measured by the Roland disability questionnaire (RDQ; Roland and Morris, 1983) than biomedical findings and pain intensity levels. Asmundson, Norton, and Allerdings (1997) described a cohort of chronic pain patients with the Multidimensional Pain Inventory (MPI; Kerns, Turk, & Rudy, 1985) and found that patients who were classified as 'dysfunctional', and thus considered most disabled, scored the highest on the Pain Anxiety Symptoms Scale (PASS; McCracken et al., 1992; McCracken, Zayfert, & Gross, 1993). Furthermore, a group of individuals taken from the general population who scored above the median score of a modified version of the Fear-Avoidance Beliefs Questionnaire (FABQ; Waddell et al., 1993) were found to have twice the risk of having an episode of pain in the next year (Linton, Buer, Vlaeyen, & Hellsing, 1999). Consequently, as the fear-avoidance model posited by Vlaeyen and colleagues (Vlaeyen & Linton, 2000; Vlaeyen et al., 1995a,b) suggests, the chronic avoidance of everyday activities will not only lead to deconditioning through disuse, but will also maintain the avoidance behaviour itself

(i.e., avoidance allows for fewer and fewer opportunities for the expectation of pain from certain activities to be discounted).

In summary, the impact of a fear of pain on the chronic pain syndrome has been extensively documented (see Vlaeyen & Linton, 2000). Anxiety and fear about pain evidently encourages poor behavioural performance, the development of disability, and may even predispose an individual towards developing an episode of pain (Linton et al., 1999; Vlaeyen et al., 1995b; Waddell et al., 1993). These results, combined with evidence suggesting that pain severity has not demonstrated a strong or consistent relationship with pain-related fear (e.g., Asmundson, Norton, & Veloso, 1999; Crombez et al., 1999; McCracken et al., 1992; Waddell et al., 1993) suggests that with remittance of tissue damage, pain chronicity becomes a product of maladaptive fear and avoidance responses. As a consequence, a number of investigations have looked at certain individual difference variables that may function as psychological vulnerability factors for developing a chronic pain syndrome.

Factors influencing the fear of pain

Several factors are considered to impact upon the propensity to be(come) fearful of pain. For example, Turk and Holzman (1986) suggest that fear-avoidance beliefs in chronic pain patients may be especially salient when the original acute pain problem resulted from sudden traumatic injury. Supporting this contention, chronic

low back pain patients who retrospectively reported a sudden traumatic pain onset scored higher on a measure of fear of movement/(re)injury, the Tampa Scale for Kinesiophobia (TSK; Kori, Miller, & Todd, 1990), than patients who reported the pain complaints started gradually (Crombez et al., 1999; Vlaeyen et al., 1995b). Other research, however, has attempted to explain how specific beliefs or cognitive appraisals of the pain experience impact upon levels of the pain-related fear and avoidance thought to promote chronicity.

Negative appraisals of the pain experience

Only recently has the potential impact of dispositional personality traits with regards to the fear and avoidance behaviour of chronic patients been considered. Certain traits are thought to impact upon the propensity of patients with chronic pain to engage in fear and avoidance behaviour and/or to respond anxiously when confronted with pain-related situations and/or sensations. As such, there is ever increasing evidence to suggest that the tendency to fear and subsequently avoid pain and pain-related situations is in part related to the propensity to negatively appraise the pain experience.

Negative appraisals or catastrophic thinking about pain may be regarded as a potential precursor of pain-related fear, which in turn is thought to begin the fear-avoidance cycle in some measure responsible for the chronic pain syndrome (Vlaeyen & Linton, 2000; Vlaeyen et al., 1995a,b). In particular, pain catastrophising is considered to be an "exaggerated negative orientation toward noxious stimuli" (Vlaeyen & Linton, 2000, p.320; i.e., the use of negative self-statements,

catastrophising thoughts, and ideation; e.g., "I worry all the time about whether it will end") and has been shown to mediate distress reactions to painful stimuli (Sullivan, Bishop, & Pivik, 1995). The propensity to catastrophise, as measured by the catastrophising subscale of the Coping Strategies Questionnaire (CSQ; Rosenstiel & Keefe, 1983), is significantly correlated with several aspects of pain-related anxiety, as measured by the Pain Anxiety Symptoms Scale (McCracken et al., 1992). Pain catastrophising has also been reported as superior to biomedical status and pain severity in predicting pain-related fear (Vlaeyen et al., 1995a,b). The tendency of acute back pain patients to catastrophise was almost seven times more important as a predictor variable than the best of the clinical and historical variables in the prospective study of back pain chronicity by Burton and colleagues (1995). The propensity to catastrophise has also been shown to differentiate chronic pain patients who were seeking help for their pain (healthcare consumers) from individuals with chronic pain who were not seeking treatment (non-consumers). Consumers reported much higher levels of pain catastrophising than the non-consumers did (Reitsma & Meijler, 1997).

Anxiety sensitivity

A construct that has received an increasing amount of attention of late and which appears intimately related to the construct of catastrophising is the propensity to fear anxiety-related bodily sensations. This sensitivity to anxiety is typically defined as the fear of anxiety-related symptoms (both somatic sensations and thoughts) arising from beliefs that these sensations will have harmful social (e.g.,

embarrassment), physical (e.g., heart attack), or psychological consequences (e.g., going crazy) (Asmundson, 1999; Reiss & McNally, 1985). Somewhat in contrast to pain catastrophising, anxiety sensitivity is purported to represent a general propensity to respond in a fearful manner to the believed negative consequences of anxiety-related symptoms.

Initially, the vast majority of research concerning anxiety sensitivity centred on the anxiety disorders, with a particular focus on panic disorder. Clark (1986) proposed that panic attacks arise from the catastrophic misinterpretation of certain bodily sensations. It is this misinterpretation and subsequent fear of relatively innocuous bodily sensations, such as palpitations, that begins the vicious cycle that culminates in a panic attack. People prone to panic attacks are thus said to have an enduring tendency to become alarmed by increases in arousal (Clark, 1986, 1988) and are considered to have elevated anxiety sensitivity (Taylor, 1995). It was the finding that there is a high degree of co-morbidity between chronic pain and certain anxiety disorders (Asmundson, Jacobson, Allerdings, & Norton, 1996; Asmundson, Norton, Allerdings, Norton, & Larsen, 1998), in addition to research suggesting that individuals with chronic pain tend to be more anxious than non-clinical populations (Craig, 1994) that has prompted researchers to investigate the validity of anxiety sensitivity in relation to chronic pain patients. Furthermore, the involvement of anxiety sensitivity in pain is suggested by the finding that patients with panic disorder frequently report persistent pain (Schmidt & Telch, 1997).

Anxiety sensitivity and chronic pain

The investigation of anxiety sensitivity in patients suffering from chronic pain is in its infancy. Preliminary evidence suggests that anxiety sensitivity is related to negative emotional experiences associated with pain (e.g., fear of pain), pain-related avoidance behaviour, and functional status in patients with chronic pain (Asmundson & Norton, 1995; Asmundson & Taylor, 1996; Plehn, Peterson, & Williams, 1998). Individuals who had become accident phobic subsequent to a motor vehicle accident and who presented with chronic pain, scored significantly higher on the Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1992) than those who had not become phobic after the accident (Kuch, Cox, Evans, & Schulman, 1994).

Asmundson and Norton (1995) found that chronic back pain patients with high anxiety sensitivity reported more fear of pain and greater avoidance of activities than those with lower anxiety sensitivity, despite comparable levels of pain. The same was true of patients suffering from recurring headaches; those with high levels of anxiety sensitivity reported greater pain-related escape/avoidance behaviour and fear of pain than did patients with medium or low anxiety sensitivity (Asmundson et al., 1999b). These groups also did not differ in headache severity.

Using structural equation modelling, Asmundson and Taylor (1996) corroborated the finding that anxiety sensitivity directly exacerbates fear of pain, even after controlling for the effects of pain severity on fear of pain. Anxiety sensitivity coupled with pain severity accounted for 43% of the variance in fear of pain (30% due to anxiety sensitivity and 13% due to pain severity; Asmundson & Taylor, 1996). On the basis of these initial results, Asmundson and colleagues

(1999a) concluded that pain-related fear and avoidance, as well as other aspects of distress associated with chronic pain, might be significantly influenced by the dispositional tendency to respond fearfully to anxiety-related thoughts and bodily sensations.

Recent research indicates an additional role for anxiety sensitivity in the exacerbation of pain. Schmidt and Cook (1999) found that anxiety sensitivity is associated with pain through its link with anxiety and is not directly associated with the pain experience. Their analyses indicated that anxiety sensitivity serves to amplify sensations of pain in some patients with panic disorder when they experience anxiety. Thus, individuals with elevated anxiety sensitivity negatively appraise symptoms of anxiety and/or pain and are consequently likely to consider any source of arousal as threatening. In addition, these individuals should be more likely to perceive a task, such as a cold pressor challenge, as threatening thereby leading to a greater experience of anxiety. Considered with prior research suggesting that anxiety sensitivity may contribute to pain through its relationship with the fear of pain (Asmundson & Taylor, 1996), the results of the study by Schmidt and Cook (1999) imply an additional role for anxiety sensitivity in the exacerbation of pain, simply by placing the individual at increased risk for experiencing anxiety.

The theory and research in this area appears to suggest that a high percentage of patients suffering from chronic pain would exhibit a high level of anxiety sensitivity. If a greater fear of pain leads to the maladaptive avoidance behaviour thought to reinforce pain chronicity then one would expect the level of anxiety sensitivity, a dispositional variable related to the fear of pain, to be somewhat

elevated in chronic pain patients. This prediction is also based on the assumption that the dispositional trait of anxiety sensitivity represents a vulnerability factor for developing a chronic pain syndrome from an acute injury. However, data suggests that anxiety sensitivity is not generally elevated in individuals with chronic musculoskeletal pain. Data collected from 399 patients with musculoskeletal pain, including those from Asmundson and Norton (1995) and Asmundson and Taylor (1996), indicate a mean Anxiety Sensitivity Index score of 16.6 (SD = 11.0; Asmundson, 1999). This value is similar to that reported by Peterson and Reiss (1992) for non-clinical samples (i.e., mean = 19.0, SD = 9.1). Scores on the Anxiety Sensitivity Index for patients with panic disorder (with or without agoraphobia) and post-traumatic stress disorder typically exceed 30, but values reported for other anxiety disorders are slightly lower with a mean of around 25 (Peterson & Reiss, 1992; Taylor, Koch, & McNally, 1992). Although data suggests that there is not a general elevation of anxiety sensitivity in patients suffering from chronic musculoskeletal pain the mean Anxiety Sensitivity Index score across all headache patients was found to be relatively high (i.e., mean = 23.8, SD = 11.4) exceeding the normative mean (Asmundson et al., 1999b).

Conceptualising anxiety sensitivity

As applied to chronic pain patients, anxiety sensitivity appears to represent the propensity to catastrophically misinterpret sensations or arousal associated with pain (Asmundson, 1999). That is, people may come to fear and avoid pain because they fear the affective and somatic arousal that it produces (Asmundson & Taylor,

1996). Research suggesting that anxiety sensitivity is associated with negative affectivity further supports this assertion (Asmundson & Norton, 1995; Asmundson et al., 1999a). Individuals high in the trait of negative affectivity are thought to be hypervigilent for all forms of threat (both external and internal; Watson & Pennebaker, 1989), and are therefore considered more vulnerable to developing specific fears (Eysenck, 1992). Thus, although Reiss (1991) describes anxiety sensitivity as a fundamental fear or trait sensitivity, it appears to reflect a propensity to be sensitive to or hypervigilent for several forms of threat.

Accordingly, the expectancy fear model from which the concept of anxiety sensitivity arose predicts that high anxiety sensitivity should also be associated with general fearfulness (i.e., hypervigilence for several forms of threat; Reiss, 1991). Research appears to support this contention. In a group of mentally healthy children (Silverman, Fleisig, Rablan, & Peterson, 1991), agoraphobics (McNally & Lorenz, 1987), and special populations (Hasten & Stokes, 1987; as cited in Reiss, 1991), high correlations were found between Anxiety Sensitivity Index scores and the total score on a variety of fear survey schedules. In addition, a number of studies have confirmed that elevated anxiety sensitivity is a particularly salient feature in a number of the anxiety disorders (e.g., Taylor et al., 1992). Furthermore, the recent finding that globally dysfunctional pain patients (as derived using the Multiaxial Assessment of Pain; Turk & Rudy, 1987, 1988) have elevated scores on the fear of cognitive and emotional dyscontrol dimension of the Anxiety Sensitivity Index is consistent with the notion that the anxiety sensitivity construct is intimately tied to fear responses in general (Reiss, 1991) and to pain-related fear and avoidance

behaviour exhibited in patients with chronic pain (Asmundson, 1999). Together, these findings suggest that elevated levels of anxiety sensitivity in an individual experiencing pain may lead to pronounced fear and avoidance of many situations and experiences related to the pain, and may also be linked to certain non-pain fears.

In summary, a negative or fearful orientation toward the pain experience has been shown to exacerbate the fear of pain and, as such, the maladaptive avoidance behaviours thought to lead to deconditioning (Asmundson, Kuperos, & Norton, 1997; Asmundson & Taylor, 1996). Initial findings suggest that anxiety sensitivity may serve, not only to exacerbate pain-related fear but also, to increase fearfulness for a number of other situations and experiences (Reiss, 1991). Thus, chronic pain patients with a high fear of pain may, in actuality, be generally fearful and as such possess a general hypervigilance for several forms of threat. The notion that some chronic pain patients are generally fearful is also support by recent research suggesting that chronic pain patients fear situations and experiences relatively unrelated to the pain.

Non-pain fears in chronic pain

Initial evidence from an investigation of individuals with chronic headache indicates that those with persistent pain may be at increased risk to fear stimuli or experiences not directly related to pain (Philips & Jahanshahi, 1986). Specifically, withdrawal from social situations was the most prominent avoidance behaviour

reported by these individuals with chronic headache. Caution should be adopted when interpreting these results, since they may reflect the extent to which the pain or pain-related fear affects daily activities and the development of disability.

Dalton and Feuerstein (1989) were among the first to report on the extent and nature of non-pain fears in chronic pain patients. Among other measures, the participants completed the Fear Survey Schedule (FSS-III; Wolpe and Lang, 1964). Their results suggest that patients with cancer pain and chronic non-cancer pain suffered from a greater number of phobias than did disabled or healthy control participants. They found that the groups did not differ on specific fears (i.e., fear of animals, injury or illness, death, social stimuli, noises and miscellaneous other stimuli) as measured by the FSS-III. The chronic non-cancer pain patients did, however, report more social avoidance when in pain than the patients and control subjects in the other groups. Unfortunately, several methodological limitations in their research, such as the small sample size and the unspecified pain foci of the chronic non-cancer pain patients, prevent conclusive interpretation of their results.

Using the Dutch version of the Fear Survey Schedule (FSS-III-R; Wolpe & Lang, 1964), Vlaeyen and colleagues (1995a) reported elevated scores, comparable to a phobic population, on the fear of bodily injury, illness, and death and social phobia subscales in chronic low back pain patients. In addition, these scales were related to the Tampa Scale for Kinesiophobia (Kori et al., 1990) a measurement of fear of movement/(re)injury. The relationship between these scales may reflect the presence of an inherent and general disposition of fearfulness possessed by many of the chronic back pain patients.

Furthermore, elevated levels of fear and avoidance of blood/injury and social interactional situations, as measured by the Fear Questionnaire (FQ; Marks & Matthews, 1979), were reported in patients with physically unexplained chronic pain (68.5% were experiencing back pain, 23.8% with limb pain, and 7.7% with neck pain) as compared to a group of individuals with a chronic condition unrelated to pain (Asmundson, Norton, & Jacobson, 1996). Significantly larger proportions of patients with chronic pain reported avoidance of injection/minor surgery, being watched/stared at, speaking/acting to an audience, and thoughts of injury/illness, but did not exhibit a greater avoidance of situations relating to agoraphobic fears (Asmundson et al., 1996b). Thus, initial research, although somewhat mixed, indicates that the fear and avoidance responses of many chronic pain patients also occur in response to social situations. Furthermore, preliminary evidence suggests not only a role for non-pain fears in the maintenance of the chronic pain syndrome, but consistently points towards the role of social anxiety or avoidance.

Anxiety disorders and chronic pain

Research has documented the prevalence of anxiety disorders and phobias in chronic pain patients (Katon, Egan, & Miller, 1985; Kinney, Gatchel, Polatin, Fogarty, & Mayer, 1993; Polatin, Kinney, Gatchel, Lillo, & Mayer, 1993). However, the data presented is limited or collapsed across patients with differing anxiety disorders and pain foci, making inferences about the nature and extent of specific fears and avoidance behaviours difficult. An initial investigation into the prevalence and impact of anxiety disorders in disabled workers with chronic musculoskeletal

pain, reported an over representation of social phobia in this group (11% of the 146 study participants; Asmundson et al., 1996a) as compared to prevalence rates in the general population (approximately 2-3%; Kaplan & Sadock, 1998). These socially phobic individuals rated themselves as more agoraphobic and socially fearful, as measured by the Fear Questionnaire (FQ; Marks & Matthews, 1979), and more anxiety sensitive, and depressed than the patients without a psychiatric diagnosis. Asmundson and colleagues (1998b) also report that a large percentage of people with chronic musculoskeletal pain, relative to the general population, meet the DSM-IV (American Psychiatric Association, 1994) criteria for post-traumatic stress disorder.

Interestingly, other anxiety disorders have been found to commonly occur comorbidly with social phobia, suggesting that vulnerability to social phobia may reflect a general vulnerability to anxiety disorders as a group, rather than to any one particular form (Davidson, Hughes, George, & Blazer, 1993). This offers one explanation as to why some individuals with pain might develop an exaggerated fear of pain; the general negative proclivity of an individual with social anxiety may predispose them toward developing a fear of pain subsequent to an acute injury. This would imply that patients with chronic pain and high levels of social anxiety would also likely experience a high fear of pain. However, thus far investigation of social fears in chronic pain patients has not gone so far as to explore the relation of these specific non-pain fears to pain-related anxiety and avoidance. Social phobia has also been linked to impaired self-rated medical health and increased health seeking behaviour (Davidson et al., 1993). Further parallels can in fact be drawn between the

persistent anxiety and chronic pain literature (Barlow, 1988; Clark, 1986; Marks, 1969; Reiss, 1991). Indeed, Rachman and Arntz (1991) suggested that, much like avoidance in phobic patients, the avoidance behaviour of patients with chronic pain is related to inaccurate expectancies, such as overestimations of the probability of noxious events.

Social anxiety

'Anxiety' refers to a "response characterised by apprehension regarding a potentially negative outcome, physiological arousal (i.e., activation of the sympathetic nervous system), and a subjective feeling of tension and nervousness" (Leary, 1988, p.366). *Social* anxiety is generally regarded as anxiety that is precipitated by interactions with other people, specifically out of concerns with how one is perceived and evaluated by others (Schlenker & Leary, 1982, 1985).

Several models suggest that biases in information processing are responsible for the persistence of early onset social fears into adulthood (e.g., Beck, Emery, & Greenberg, 1985; Heimberg & Barlow, 1988). Clark and Wells (1995) hypothesise that in social situations socially anxious people focus on monitoring themselves, particularly their anxiety-related internal sensations, thoughts, and behaviours. Self-focused attention increases the salience of this negative self-rated information at the expense of external information about the social situation. This not only exacerbates the situation, but leads to negative biases in the person's social judgements both during and after the situation. The adoption of safety behaviours, much like the pattern of fear and avoidance described in fear-avoidance models, contributes to this

process by reducing anxiety, increasing self-focused attention and preventing the disconfirmation of negative beliefs. Consequently, negative self and social judgements pervade the thoughts of individuals with social anxiety (e.g., Alden & Wallace, 1995).

The cognitive distortions or aberrations characteristic of individuals experiencing social anxiety include a selective memory for negative interactions (Lundh & Ost, 1997), an underestimation of social skills (Halford & Foddy, 1982), internal attributions for failure situations (Beidel, Turner, & Dancu, 1985; Halford & Foddy, 1982), and negative self-evaluations (Jones, Briggs, & Smith, 1986). In addition, an increased awareness of somatic aspects of anxiety can lead individuals to overestimate how anxious they appear to others and consequently underestimate how well they come across (Mansell & Clark, 1999; Wells & Papageorgiou, 2001). The cognitive aberrations characteristic of socially anxious individuals also lead to physiological correlates of social anxiety such as high physiological reactivity (Beidel et al., 1985), blushing, stomach upsets, and heart pounding.

The negative penchant of a socially anxious individual would no doubt impact upon the experience and perception of pain in a negative way. As suggested by Vlaeyen and colleagues (Vlaeyen & Linton, 2000; Vlaeyen et al., 1995a,b) in their fear-avoidance model of pain, the propensity to appraise situations and experiences in a negative or fearful manner may not only predispose an individual toward developing an exaggerated fear of pain, but may also encourage fears salient to the pain patient's situation.

The nature of social fears in chronic pain

Aside from establishing that chronic pain patients exhibit elevated social avoidance and that a higher proportion of these patients, compared to the general population, reach the criteria for social phobia, very little is known about the nature and extent of these social fears.

To date, studies have used general fear measures (i.e., the Fear Survey Schedule and the Fear Questionnaire) to assess non-pain fears in chronic pain patients (Asmundson et al., 1996a,b; Vlaeyen et al., 1995a). While the social phobia subscale of the Fear Questionnaire appears to have adequate construct validity and psychometric properties (see Marks & Matthews, 1979), it was originally designed as a brief self-rating scale, not as a comprehensive device to assess social anxiety. Since the social phobia subscale involves only five items – eating or drinking with other people; being watched or stared at; talking to people in authority; being criticised; and speaking or acting to an audience – it disregards important social fears, such as the generalised fear of social interaction and fear of negative evaluation. As such it is a less than adequate measure of social anxiety. General fear measures, such as the Fear Questionnaire (Marks & Matthews, 1979) and the Fear Survey Schedule (Wolpe & Lange, 1964), also fail to assess the cognitive processes considered important in current conceptualisations of social anxiety and social phobia (Clark & Wells, 1995).

Furthermore, although the Fear Survey Schedule measures the degree of anxiety felt with respect to the stimulus situation, studies using the Fear Questionnaire (Asmundson et al., 1996a,b) to measure the degree to which an

individual avoids social situations, operate under the assumption that avoidance behaviour is a necessary consequence of its corresponding fear. Leary (1988) points out that the inclusion of certain behaviours, such as avoidance or reticence, has generated confusion in some definitions and measures of social anxiety. Leary (1988) goes on to say that defining anxiety in terms of overt behaviour not only creates conceptual confusion, but also confounds the measurement of social anxiety and its behavioural correlates. Thus, feeling anxious or fearful is conceptually distinguishable from escape from or avoidance of the feared situation; although the occurrence of social avoidance behaviours may correlate with social anxiety the two are not necessarily synonymous. In order to confirm that chronic pain patients indeed exhibit elevated levels of social anxiety *and* avoidance relative to healthy or non-clinical controls further investigation, using more specific measures of social anxiety and avoidance, is required.

The social avoidance reported by chronic pain patients may well be a consequence of both their level of pain severity and pain-related fear, and thus would be classed merely as pain-related avoidance behaviour. Conversely, the social avoidance may be a direct consequence of a premorbid fear of social situations and may have predisposed the individual toward developing an exaggerated fear of pain and, consequently, a chronic pain syndrome. Furthermore, whether and how this social avoidance relates to pain-related anxiety and avoidance in chronic pain patients needs to be delineated.

Finally, given that anxiety sensitivity has been linked with a propensity to respond in a fearful manner to several forms of threat (Reiss, 1991), and evidence

suggests that this propensity may influence the tendency to fear pain (Asmundson & Taylor, 1996), anxiety sensitivity may also be involved in the development of other fears salient to the individual. The importance of anxiety sensitivity with regards to social anxiety, in particular, is implicated by research indicating that highly socially anxious individuals use the concomitants of anxiety to overestimate how anxious they appear and how well they come across (Mansell & Clark, 1999; Wells & Papageorgiou, 2001). That is, socially anxious individuals interpret anxiety-related symptoms or sensations in a fearful manner because they believe these sensations will have harmful social, and perhaps psychological, consequences. Research linking anxiety sensitivity and social fears has, in the past, reported mixed findings (Taylor, 1995), but to date, no studies have explored the relationship of anxiety sensitivity to specific measures of social anxiety and avoidance in a chronic pain population. Indeed, the source of both sets of seemingly distinct fears may be found in this propensity to be sensitive or hypervigilent for several forms of threat. As such, anxiety sensitivity may predict or explain the apparent relationship between chronic pain and social anxiety.

Summary

Fear of pain has been proposed as a mechanism through which pain is maintained over time. Fear-avoidance models (e.g., Lethem et al., 1983; Vlaeyen et al., 1995a,b) postulate a vicious cycle in which negative expectancies (i.e., unpropitious or catastrophic thoughts and beliefs) about the insidious nature of pain

initiate avoidance behaviour that, through association with deconditioning, disuse, and anxiety reduction, leads to further pain expectancies and increased avoidance. Accordingly, evidence suggests that negative appraisals or catastrophic thinking about pain and its consequences exacerbates a fear of pain. In particular, recent findings suggest that anxiety sensitivity – a tendency to respond fearfully to anxiety- and/or pain-related somatic sensations – may play a role in the onset and maintenance of chronic pain vis à vis its relationship with fear of pain and related avoidance behaviours (Asmundson & Norton, 1995; Asmundson & Taylor, 1996; Asmundson et al., 1999a). Anxiety sensitivity may also increase pain through its relationship with anxiety itself (Schmidt & Cook, 1999). Although the trait of anxiety sensitivity does not appear to be elevated in patients with chronic musculoskeletal pain, as theory and research might suggest, those with high anxiety sensitivity do report greater pain-related fear and escape/avoidance behaviour, depression, and negative mood than chronic pain patients with low anxiety sensitivity (Asmundson & Norton, 1995), and thus may be at risk for experiencing further chronicity. The construct of anxiety sensitivity has also been linked with certain anxiety disorders and is intimately tied to fear responses in general (Reiss, 1991).

Fear and avoidance of other experiences and situations relatively unrelated to the pain have also been reported in chronic pain patients and are thought to compound the problem of avoidance and subsequent deconditioning. Specifically, patients with chronic pain report elevated levels of social avoidance in comparison to both healthy controls and patients with a chronic condition unrelated to pain

(Asmundson et al., 1996b; Philips & Jahanshahi, 1986; Vlaeyen et al. 1995a). It is unclear how the social avoidance exhibited by chronic pain patients relates to the pain-related fear and avoidance commonly exhibited by these patients. A trait which marks an individual's general propensity to develop fears (i.e., anxiety sensitivity) may also be involved in the development of other fears salient to an individual experiencing pain. Thus, the propensity to be fearful of or sensitive to anxiety- or indeed pain-related somatic sensations might explain the presence of the social avoidance and/or fears in chronic pain patients. However, to date the dispositional trait of anxiety sensitivity has not been investigated in relation to the social avoidance/fears exhibited by some chronic pain patients. Indeed, the fearfulness typical of an individual with high anxiety sensitivity may lead not only a pronounced pain-related fear and avoidance following an acute injury or pathology, but also to fear and avoidance of other situations unrelated to the pain, in particular social interactional situations.

Research questions and hypotheses

I. The first hypothesis is derived from initial research indicating that chronic pain patients often report elevated social fears on subscales of general fear measures (i.e., FQ, FSS-III) as compared to controls (Asmundson et al., 1996b; Vlaeyen et al., 1995a). Knowledge concerning the elevated social fears exhibited by chronic pain patients is limited by the use of measures assessing a number of common fears (i.e., Fear Survey Schedule, Fear Questionnaire). The Fear Questionnaire, in particular, was originally developed for use as a brief-rating scale and not as a comprehensive measure of social anxiety. Furthermore, the social phobia subscales of general fear measures focus primarily on avoidance of feared situations, and as a consequence fail to assess generalised fear of social interactions or fear of negative evaluation.

In addition, the studies reporting elevated social fears in chronic pain patients have either likened patients' scores on general fear questionnaires to norms from phobic populations (Vlaeyen et al., 1995a) or have used a control group with a chronic condition unrelated to pain (Asmundson et al., 1996b). The use of a pain-relevant control group, such as individuals with pain who are not receiving treatment, would offer more persuasive information concerning the extent of chronic pain patients' social fears.

Overall, the present study considers the replicability and stability of these initial findings with respect to additional, more specific, measures of social anxiety and avoidance. As such, clinic-referred chronic pain patients are anticipated to report

higher levels of social anxiety and avoidance, on a number of measures,[2] as compared to a community-based pain group and a group reporting little or no specific pain.

II. The second hypothesis investigates the possible relationship between reports of social anxiety in chronic pain patients and pain severity. As stated in the previous section, the elevated social anxiety and avoidance reported by patients with chronic musculoskeletal pain may to a certain degree be a function of pain severity and, as such, can be classified merely as pain-related fear and avoidance behaviour. However, epidemiological studies (e.g., Davidson et al., 1993) suggest that social phobia and/or social anxiety traditionally have an early onset in late childhood/early adolescence and often precede the onset of other comorbid states, such as depression and other anxiety disorders. This finding has consequently been confirmed with regards to chronic pain; Workers with chronic musculoskeletal pain coupled with a clinical diagnosis of social phobia reported that their social fears always preceded injury with onset in childhood or adolescence (Asmundson et al., 1996a). These workers also do not report higher pain intensity relative to chronic musculoskeletal pain patients without psychiatric diagnosis.

As a result, the social anxiety/avoidance reported by chronic pain patients is believed to occur relatively independently of pain severity. Thus, the anticipated between-group differences in social anxiety and avoidance are expected to remain

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[2] To allow direct comparison with previous research documenting elevated levels of social avoidance in patients suffering from chronic pain the Fear Questionnaire was used alongside more specific and detailed measures of social-evaluative anxiety.

stable after controlling for the effects of pain severity. That is, clinic-referred chronic pain patients are expected to report higher levels of social anxiety and avoidance, than either a community-based pain group or a group reporting little or no pain, even after the effects of pain severity are controlled for.

III & IV. The third and fourth hypotheses investigate the degree to which chronic pain patients are fearful and avoidant of pain, as compared with controls, over and above the pain severity they experience. Fear-avoidance theory (e.g., Vlaeyen et al., 1995a,b) suggests that chronic pain is often initiated and maintained by an exaggerated fear of pain and related avoidance behaviours. In the past, pain severity was reasonably assumed to influence an individuals' propensity to be(come) fearful of pain. However, research suggests a lack of concordance between pain severity and fear-avoidance beliefs, fear of pain, and pain-related escape/avoidance (Asmundson et al., 1999a; Crombez et al., 1999; McCracken et al., 1992). It has since been concluded that pain severity bears little relation to the fear-avoidance beliefs thought to contribute to chronicity (Waddell et al., 1993). Considered in concordance with research reporting elevated levels of non-pain fear in chronic pain patients, the above theory and research suggests that these patients may possess a generalised tendency to respond with fear to a variety of aversive stimuli (Asmundson et al., 1996b; Vlaeyen et al., 1995a). This general propensity toward fearfulness may help to explain the psychological distress and illness behaviours frequently reported in patients with chronic pain.

Any differences found between clinic-referred chronic pain patients, people with pain not receiving treatment, and healthy controls, with regards to pain-related fear and avoidance would not be especially surprising or informative per se; however, controlling for the variable that these groups differ most on (i.e., pain severity) would provide information on the degree to which chronic pain patients' fear of pain is dependent on the level of pain severity experienced. As might be expected, chronic pain patients are more fearful and avoidant of pain relative to healthy controls (Dalton & Feuerstein, 1989). Initial research also indicates that people with pain not receiving treatment (non-consumers) report lower levels of pain-related distress and distorted cognitions than chronic pain patients receiving treatment (Reitsma & Meijler, 1997). These studies have not however investigated whether these differences in pain-related variables are due to fundamental psychological differences between the groups or due to the level of pain severity experienced.

The present study anticipates that clinic-referred chronic pain patients will report higher levels of pain-related anxiety and avoidance behaviour than both a community-based pain group and a group reporting little or no specific pain. These between group differences are anticipated to remain stable when the effects of pain severity are controlled for. That is, clinic-referred chronic pain patients are anticipated to report higher levels of pain-related anxiety and avoidance than either the community-based pain group and/or the group reporting little or no specific pain, even after the effects of pain severity are controlled for.

V. Although initial research suggests that anxiety sensitivity (i.e., the fear of anxiety-related somatic sensations) is not generally elevated in patients with chronic musculoskeletal pain as compared with non-clinical controls (see Asmundson, 1999), there have been reports of elevated anxiety sensitivity in pain patients suffering from recurring headaches (Asmundson et al., 1999b). Since the present study uses clinic-referred chronic pain patients (i.e., patients who were receiving treatment for their pain at a specialist pain clinic) with a variety of serious pain conditions, these patients are anticipated to report elevated anxiety sensitivity as compared with healthy controls or those in the community reporting pain.

VI. Anxiety sensitivity, as well as being elevated in the clinic-referred chronic pain patients, is expected to impact upon reports of both social and pain-related anxiety and avoidance. Initial evidence from Asmundson and Taylor (1996) supports the contention that anxiety sensitivity directly exacerbates a fear of pain, even after controlling for the effects of pain severity on fear of pain. These results are consistent with Reiss' (1991) view that many fears can be reduced to more basic fears, such as a fear of anxiety-related bodily sensations. With this in mind, the fear of anxiety-related somatic sensations might also serve to exacerbate social anxiety and avoidance, due to beliefs that these sensations will have harmful social consequences. The present study anticipates that the aforementioned between-group differences in social anxiety/avoidance and pain-related anxiety avoidance will disappear once the effects of anxiety sensitivity are controlled for. That is, the clinic-

referred chronic pain patients are expected to report higher levels of social and pain-related fear as a function of their high levels of anxiety sensitivity.

VII. The seventh hypothesis considers the possible link between social anxiety and avoidance and pain-related cognitive/affective variables. Many questions remain with regards to the relationship of social fears to persistent pain. Does the fear of pain generalise to situations closely related to the experience of pain (Vlaeyen et al., 1995a), such that non-pain fears arise primarily as a consequence of injury? Or do chronic pain patients pathologically fear social situations independent of a fear of pain? Although research has documented both elevated social anxiety/avoidance and higher prevalence rates (as compared to the general population) of social phobia in patients with chronic musculoskeletal pain (Asmundson et al., 1996a,b), the relationship of this social anxiety/avoidance to other fears and avoidance behaviours exhibited by chronic pain patients is relatively unknown. However, one study has indicated that fear of movement/(re)injury (as measured by the TSK) is related to social fears, as measured by the social phobia subscale of the FSS-III (Vlaeyen et al., 1995a). The present study anticipates that high levels of social anxiety and avoidance will be related to high levels of pain-related anxiety and avoidance, with regards to those experiencing pain.

VIII. While there is evidence of elevated social fears in patients with chronic musculoskeletal pain (Asmundson et al., 1996b), these fears have not been assessed in the context of anxiety sensitivity. The importance of anxiety sensitivity with

regards to social anxiety is implicated by research indicating that highly socially anxious individuals use the concomitants of anxiety to overestimate how anxious the appear and how well the come across (Mansell & Clark, 1999; Wells & Papageorgiou, 2001). Accordingly, social fears are likely to be related to beliefs about the negative social, and perhaps psychological, consequences of the experience of anxiety-related somatic sensations. As such, the eighth hypothesis investigates the relationship between social anxiety and avoidance and anxiety sensitivity in those experiencing pain. With regards to those experiencing pain, high anxiety sensitivity is expected to be associated with a propensity to fear additional situations salient to the experience of chronic pain, in this instance, social interactional situations.

IX. Furthermore, anxiety sensitivity may explain the proposed relationship between pain-related anxiety and social anxiety and avoidance. The propensity to be fearful of or sensitive to anxiety-related somatic sensations has been linked to general fearfulness in a number of populations (see Reiss, 1991; Taylor, 1995). Anxiety sensitivity has also been implicated in the development of an exaggerated fear of pain (Asmundson & Taylor, 1996). As such, the exaggerated fear response commonly exhibited by those high in anxiety sensitivity may explain why certain individuals with chronic pain exhibit both pain-related fear and anxiety about social situations (see Figure 2.). The relationship between pain-related fear and social anxiety is anticipated to be dependent on anxiety sensitivity, such that when the propensity to fear anxiety-related somatic sensations is taken into account pain-

related anxiety and social anxiety will no longer be related. That is, high levels of pain-related anxiety will only be related to a high level of social anxiety in the presence of high levels of anxiety sensitivity.

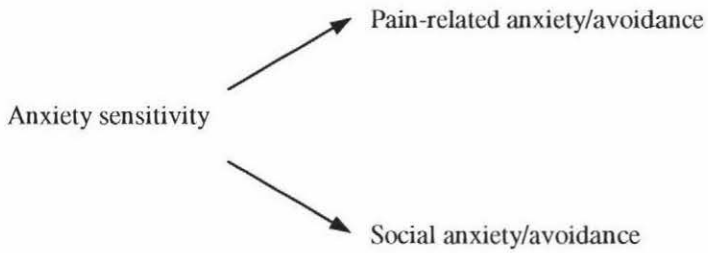

Figure 2. The proposed relationship between pain-related anxiety/avoidance and social anxiety/avoidance.

Method

Method

Participants

The study sample comprised three groups. The first group consisted of patients who were currently experiencing chronic pain (i.e., persistent or recurring pain for a duration of at least 3 months; International Association for the Study Pain, 1986) and had been referred to a pain clinic. The two other groups were drawn from the community as a comparison for clinic-referred chronic pain patients. The first community-based group was composed of individuals reporting pain, while the second group included those reporting little or no specific pain.

The sample of chronic pain patients was made up of 46 individuals (13 male; 33 female; mean age = 44.5 years [SD = 13.51]) who were attending one of the pain services[3] in New Zealand for the treatment of persistent pain and disability. All pain patients attending the pain clinics were given the opportunity to participate in the study, irrespective of their number of visits to the clinic. However, those patients who had previously received extensive psychological intervention or had demonstrated a dramatic response to intervention were excluded at the discretion of the clinicians. In all cases the pain: (a) could not be wholly accounted for by identifiable physical pathology, and (b) had lasted for a minimum duration of three months (mean duration of pain = 89.04 months [SD = 73.19]). The type of pain in

[3] The pain services included: Waikato Hospital Pain Clinic; Palmerston North Hospital Rehabilitation Centre; Wellington Hospital Pain Clinic; and Dunedin Hospital Pain Clinic.

this sample was relatively diverse: 30.43% reported chronic low back pain, 8.70% reported complex regional pain syndrome, 4.35% reported headache, 2.17% reported occupational overuse syndrome, 2.17% reported neuropathic pain, 2.17% reported whiplash or neck pain, and 10.87% reported other types or areas of pain, such as endometriosis and regional nerve pain. The remaining proportion of the sample (39.14%) reported experiencing 2 or more areas or types of pain. Of this number a further 19.56% of the total sample reported chronic low back pain (amongst other types of pain). Over half (53%) of the clinic-referred chronic pain patients reported being unable to work, although approximately a quarter (26%) of these patients were either in full- or part-time work.

The community-based sample was recruited from a variety of local businesses[4] in Palmerston North, New Zealand. This sample (n = 123) was split into participants reporting pain and those reporting little or no specific pain. Of the respondents reporting pain, 24 stated having received specialist treatment for their pain in a pain clinic. Since this group of participants did not differ significantly from those reporting pain without specialist treatment on any of variables in the present study,[5] for the purpose of data analysis the two subgroups were combined. The group of respondents reporting pain was made up of 66 individuals (21 male; 45 female; mean age = 37.34 years [SD = 15.77]). The type of pain reported by this group was very varied: 21.21% reported chronic low back pain, 21.21% reported headache, 7.58% reported occupational overuse syndrome, and 15.15% reported other types or areas of pain, such as limb pain and problems with broken bones. Of the remaining

[4] These businesses included: Painters and decorators; an Insurance Broker; Retailers; Hospitality establishments; NZ Post; Care facilities; Massey University.

34.85% reporting 2 or more types of pain, 16 (24.24% of the total group) reported headache (amongst other pain). Finally, the community-based group of respondents reporting little or no specific pain comprised of 57 individuals (30 male; 27 female; mean age = 33.84 years [SD = 12.30]).

Procedure

The clinic-referred individuals experiencing chronic pain were approached by clinic staff during a visit to their local pain service, and were given the opportunity to participate in the present study. Participants in the comparison group were contacted through their work place and were also given the opportunity to participate in the present study. In an attempt to create control groups that were comparable to the clinic-referred chronic pain sample in terms of variety of age, background, and occupation, a range of local businesses in the Palmerston North area were contacted.

All participants were able to take the questionnaire away and return it at their earliest convenience by freepost envelope. It was made clear to all participants that if they chose to return a completed questionnaire it would then be assumed that they had consented to participate in the study.

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[5] With the exception of pain duration.

Measures[6]

Fear of pain

The Pain Anxiety Symptoms Scale (PASS; McCracken et al., 1992, 1993b) was designed for use with persons with chronic or recurrent pain disorders. It assesses pain specific anxiety symptoms and consists of four 10-item subscales measuring (1) cognitive anxiety responses (e.g., I can't think straight when in pain"); (2) fearful appraisals (e.g., "I think that if my pain gets too severe, it will never decrease"); (3) physiological anxiety responses (e.g., "I become sweaty when in pain"); (4) escape and avoidance behaviour (e.g., I will stop any activity as soon as I sense pain coming on"). All items are rated on a frequency scale from 0 (never) to 5 (always). The PASS subscales have demonstrated satisfactory internal consistency (alphas ranging from 0.74 to 0.89), test-retest reliability, and validity (McCracken et al., 1992, 1993b; McCracken & Gross, 1995). The validity of the scores from the PASS also been supported by significant positive correlations with measures of anxiety, pain, and disability (Burns, Mullen, Higdon, Wei, & Lansky, 2000; McCracken, Gross, Aikens, & Carnrike, 1996; McCracken et al., 1993b). The factor structure and psychometric properties of the PASS have also been examined in a community-based sample (Osman, Barrios, Osman, Schneekloth, & Troutman, 1994), where support was found for the generalisability of the one- and four- factor structures of the PASS to non-clinical samples. Adequate internal consistency was also reported for the subscales (alpha values ranging from 0.76 to 0.94; Osman et al., 1994).

[6] See appendices 2 – 8 for the following measures.

Non-pain fear and avoidance

The Fear Questionnaire (FQ; Marks & Matthews, 1979) is a short, reliable, and valid (Cox, Swinson, & Shaw, 1991; Marks & Matthews, 1979) self-report questionnaire that identifies fear and avoidance behaviours associated with three specific dimensions of fear: agoraphobia, social phobia, and blood/injury phobia (see Arrindell, Emmelkamp, & Van der Ende, 1984). The FQ has good test-retest reliability (agoraphobia subscale: r = 0.89; blood-injury subscale: r = 0.96; social phobia subscale: r = 0.82; Marks & Matthews, 1979). The FQ subscales tend to have higher internal consistency in clinical samples, with alpha coefficients ranging from 0.69 to 0.76, rather than non-clinical samples (with alpha coefficients ranging from 0.59 to 0.77; Cox et al., 1991).

Individual items are ranked on a nine-point rating scale ranging from 0 ("Would not avoid it") to 8 ("Always avoid it"). The original anchors for the nine-point rating scale were altered as it was found that the New Zealand sample had some difficulty in distinguishing the difference between 4 ("Definitely avoid it") and 6 ("Markedly avoid it"). As a consequence, the anchors were changed to: 4 ("Often avoid it") and 6 ("Mostly avoid it") in order that each anchor would represent a relative frequency of avoidance or fear.

Social anxiety and avoidance

The Social Avoidance and Distress (SAD) scale and the Fear of Negative Evaluation (FNE) scale (Watson & Friend, 1969) are self-report questionnaires that

measure separable but overlapping dimensions of social evaluative anxiety. The SAD and FNE are used as subjective indices of general interpersonal discomfort (anxious arousal as well as avoidance) and cognitive evaluative impairment, respectively. The SAD scale consists of 28 statements balanced equally with positively and negatively worded items, such as "I am usually nervous with people unless I know them well"(distress) and "I try to avoid talking to people unless I know them well"(avoidance). Although the original scale used a true-false format, much recent research and the present study used a 5-point Likert scales on which respondents indicate the degree to which they agree or disagree with each statement (Leary, 1983b). Interitem reliability (Cronbach's alpha) of the 28 items is approximately 0.90 on both true-false and Likert versions of the scale (Leary, Knight, & Johnson, 1987; Watson & Friend, 1969), and test-retest reliability falls between 0.68 and 0.79 (Girodo, Dotzenroth, & Stein, 1981; Watson & Friend, 1969). Scores on the SAD correlate highly (r's > 0.50) with other measures of social anxiousness, including shyness, interaction anxiousness, fear of negative evaluation, and audience anxiety (Jones et al., 1986; Leary, 1983a; Watson & Friend, 1969). In order to avoid confounding the measurement of social anxiety with the measurement of avoidance (Leary, 1983a) it is advised that the SAD scale be split into its two distinct subscales of avoidance and distress (Leary, 1988). Both subscales have adequate alpha coefficients (> 0.80) and they correlate $r = 0.75$ with one another (Leary, 1988; Leary et al., 1987; Watson & Friend, 1969). The scores are expressed as sums of responses indicating greater anxiety or avoidance.

An important ingredient in social anxiety is considered to be a concern for how one is perceived and evaluated by others (see Schlenker & Leary, 1982, 1985; Zimbardo, 1977). Consequently, a construct that is conceptually related to social anxiousness is fear of negative evaluation (Watson & Friend, 1969), and although not a measure of social anxiousness per se, the FNE scale is often used to identify individuals who are most prone to feelings of social anxiety (Leary, 1988). The FNE scale is made up of 30 true-false items, such as "I rarely worry about seeming foolish to others" and "I react very little when other people disapprove of me". The FNE has a reliability coefficient of 0.94, and displays strong evidence of construct and criterion validity (Watson & Friend, 1969). The scale possesses good psychometric properties (test-retest correlations of 0.78 to 0.94; Watson & Friend, 1969) and correlates moderately with more direct measures of social anxiety (Leary, 1988; Jones et al., 1986; Watson & Friend, 1969). The wording of positive and negative statements is balanced in both scales in order to limit the effects of response set.

Anxiety Sensitivity

The Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1992) is designed to measure the fear of anxiety-related symptoms and is a valid and reliable (Peterson & Reiss, 1992; McNally, 1996) 16-item questionnaire. The ASI has a high degree of internal consistency, with alpha coefficients ranging from 0.82 to 0.91 (Peterson & Reiss, 1992). It has satisfactory test-retest reliability over 3 years (r = 0.71; Maller & Reiss, 1992) and is not interchangeable with measures of general anxiety (McNally, 1996). Evidence suggests that anxiety sensitivity is related to negative emotional

experiences associated with pain (e.g., fear of pain), pain-related avoidance behaviour, and functional status in patients with chronic pain (Asmundson & Norton, 1995; Asmundson & Taylor, 1996; Plehn et al., 1999). Recently, some investigators have suggested that the ASI may not only assess fear of anxiety per se, but other arousal states such as those associated with atypical, unpredictable or aversive somatic sensations (Asmundson, 1999; Cox, Borger, & Enns, 1999).

The original conceptualisation and subsequent studies of anxiety sensitivity in patients with chronic musculoskeletal pain treated the construct as uni-dimensional. Recent studies conducted on samples of non-clinical participants and patients with anxiety disorders suggest that anxiety sensitivity comprises of multiple dimensions (for a review, see Taylor, 1995). Investigations have found evidence for a single factor (Reiss, Peterson, Gursky, & McNally, 1986; Taylor, Koch, & Crockett, 1991), three-factor (Stewart, Taylor, & Baker, 1997; Zinarg, Barlow, & Brown, 1997) and a four-factor solution (Peterson & Heilbronner, 1987). However, a study by Asmundson and colleagues (Asmundson, Frombach, & Hadjistavropoulos, 1998) suggests that anxiety sensitivity, when measured in a sample of injured workers, is best conceptualised as a multidimensional construct comprising two factors. These factors include fear of cognitive and emotional dyscontrol and fear of somatic sensations. The two factors appear to be related to different aspects of the pain experience. Specifically, fear of somatic sensations (e.g., "It scares me when I feel faint") was uniquely related to measures of pain severity, avoidance behaviour and fearful appraisals of pain. Conversely, fear of cognitive and emotional dyscontrol (e.g., "I scares me when I am unable to keep my mind on a task") was

uniquely associated with negative affect (Asmundson et al., 1998a). Respondents were asked to indicate their degree of endorsement for each item on the ASI using a 5-point Likert scale (scored from 0-4). All items on the ASI are negatively weighted.

Pain severity

Pain severity was assessed by two measures: (1) pain duration (months), and (2) self-report categorical visual analogue scales of pain severity. Both the clinic-referred chronic pain patients and the participants in the community-based comparison groups were asked to rate their average, least, and worst pain over the last month, as well as their current pain, on 11-point (0 through 10) scales with '0' indicating "no pain" and a '10' indicating pain as "intense as you can imagine". Participants were asked to circle the appropriate number on each of the four scales.

In the interests of clarity a numerical rating scale was used to measure pain severity, as there have been some reports that visual analogue scales cause problems in understanding. This seems especially true among older patients, as shown by the significant correlation between age and incorrect responding to VAS (Jensen, Karoly, & Braver, 1986; Kremer, Atkinson, & Ignelzi, 1981). The numerical rating scale was, however, presented in a similar format to that of a VAS in order that participants could label mid points should they desire. For the purposes of data analysis an average pain severity score was calculated by taking the mean of the current, average, least, and worst ratings of pain severity.

Results

Results

Statistical analysis

Prior to analysis, the variables were screened for assumptions of statistical analysis. Following the suggestion from Tabachnik and Fidell (2001) that conventional but conservative alpha levels (i.e., $p < 0.001$) be used to evaluate the significance of skewness and kurtosis, logarithmic transformations were applied to the pain duration and agoraphobia variables, which significantly improved their distributions. A case with missing values on the Anxiety Sensitivity Index (ASI) and the Pain Anxiety Symptoms Scale (PASS) was deleted entirely from the clinic-referred chronic pain group. A further three cases from the clinic-referred chronic pain group with high Z scores on the agoraphobia subscale of the Fear Questionnaire (FQ) were found to be univariate outliers and were removed from subsequent analyses involving this variable. An additional case from the clinic-referred chronic pain patients was identified as a univariate outlier due to high Z scores on the social phobia subscale of the FQ and likewise was removed from subsequent analyses concerning this variable. Three cases in the community-based pain group were also identified as univariate outliers due to their high Z scores on the pain duration variable and were removed from subsequent analyses involving this variable. A further case in the community-based pain group was identified as a univariate outlier due to high Z scores on the fear of cognitive and emotional dyscontrol subscale of the ASI and the agoraphobia subscale of the FQ and was removed from subsequent

analyses concerning this variable. No other cases were identified through Mahalanobis distance as being multivariate outliers with $p < 0.001$. Internal consistency (Cronbach's alpha) estimates for all the self-report scales ranged from satisfactory to excellent (see Table 1.). Means and standard deviations of the self-report measures for the three groups are presented in Table 1.

Between-groups analysis

In order to investigate the hypothesised between-group differences on pain-related cognitive/affective variables, in addition to the predicted differences in social anxiety and avoidance, a series of univariate analyses of variance (ANOVA) were performed with the sample group (clinic-referred chronic pain patients vs community pain group vs little or no pain group) as the independent variable and self-report measures as the dependent variables. Analyses were performed by SPSS GLM, weighting cells by their sample sizes to adjust for unequal n.[7] These analyses, presented in Table 1., were conducted with alpha set at the traditional level (i.e., $p < 0.05$). Post hoc analyses, using Tukey's honestly significant difference (HSD), were conducted on the significant between-group effects to determine whether the clinic-referred-chronic pain group differed from the community-based pain group and the group reporting little or no specific pain.

[7] Overall and Spiegel (1969) advocate using Method 2 (i.e., SPSS: Method = SSType 1) for dealing with unequal sample sizes in survey or non-experimental research.

Social anxiety and avoidance

Significant differences were found between the groups on fear of negative evaluation, the Social Avoidance and Distress (SAD) social distress subscale, the SAD social avoidance subscale, and the social phobia subscale of the FQ. As regards the measures of other non-pain fears, a significant group effect was also observed for the agoraphobia subscale of the FQ. However, the groups did not differ significantly on the FQ blood/injury phobia subscale. Post-hoc analyses, using Tukey's HSD, revealed that clinic-referred chronic pain patients reported significantly higher scores on the fear of negative evaluation scale, the SAD social distress subscale, and the SAD social avoidance subscale as compared with respondents both from the community-based pain group and the group reporting little or no specific pain (all $p < 0.01$). Tukey's HSD post-hoc analyses also revealed that the clinic-referred chronic pain patients scored higher on the FQ social phobia subscale as compared with respondents reporting little or no specific pain (all $p < 0.01$). Furthermore, clinic-referred chronic pain patients reported significantly higher scores on the FQ agoraphobia subscale as compared with respondents both from the community-based pain group and the group reporting little or no specific pain (all $p < 0.01$). However, Tukey's HSD post-hoc analyses found no significant differences between the community-based pain group and the group reporting little or no pain with regards to their scores on the fear of negative evaluation scale, the SAD social distress subscale, the SAD social avoidance subscale, or the social phobia and agoraphobia subscales of the FQ.

Table 1. Means and standard deviations for self-report data provided by clinic-referred chronic pain patients, a community-based group reporting pain, and a community-based group reporting little or no specific pain.

	Chronic pain patients	Community pain group	Little or no pain group	Total sample	Univariate		
Measure	(n = 45)	(n = 66)	(n = 57)	α	*n*	*F*	*p*
Age (years)	44.3 ± 13.6	37.3 ± 15.7	33.8 ± 12.3	-	168	7.11	0.001
Pain duration (months)[b]	88.2 ± 73.3	73.6 ± 70.5	0.37 ± 2.4	-	108	3.59[c]	0.061
Pain severity[a]	6.0 ± 1.5	3.3 ± 1.4	0.77 ± 0.8	-	111	91.85[c]	0.000
Fearful appraisals[PASS]	19.4 ± 8.54	14.8 ± 9.1	10.9 ± 7.6	.80	168	12.62	0.000
Cognitive anxiety[PASS]	31.1 ± 9.8	21.1 ± 9.6	18.0 ± 9.9	.89	168	24.07	0.000
Physiological anxiety[PASS]	20.9 ± 10.7	14.4 ± 10.6	12.8 ± 10.2	.90	168	8.20	0.000
Escape/Avoidance[PASS]	26.1 ± 7.1	20.6 ± 8.5	20.2 ± 7.7	.71	168	8.58	0.000
FNE	99.8 ± 20.0	84.7 ± 20.5	80.8 ± 19.2	.95	168	12.37	0.000
Social distress[SAD]	44.4 ± 9.8	35.3 ± 8.9	35.9 ± 12.0	.84	168	12.19	0.000
Social avoidance[SAD]	41.6 ± 9.6	34.5 ± 8.2	33.4 ± 9.9	.85	168	11.59	0.000
Social phobia[FQ]	15.3 ± 8.8	11.9 ± 6.9	9.0 ± 6.8	.69	167	8.86	0.000
Blood/Injury phobia[FQ]	10.2 ± 8.7	10.0 ± 6.5	10.0 ± 8.4	.67	168	0.01	0.985
Agoraphobia[FQ b]	9.9 ± 8.2	5.1 ± 6.5	4.2 ± 5.3	.72	164	8.53	0.000
Fear of somatic sensations[ASI]	16.2 ± 6.3	13.3 ± 6.3	12.2 ± 5.6	.87	168	5.56	0.005
Fear of cognitive and emotional dyscontrol[ASI]	17.7 ± 5.5	13.2 ± 4.7	12.4 ± 4.1	.78	167	17.55	0.000

Note: [PASS] = subscale of the Pain Anxiety Symptoms Scale; [SAD] = subscale of the Social Avoidance and Distress scale; [FQ] = subscale of the Fear Questionnaire; [ASI] = subscale of the Anxiety Sensitivity Index; [a] Average pain severity rating; [b] for the purpose of data analysis the log of this score was used; [c] The ANOVA was performed between the clinic-referred chronic pain patients and the community-based pain group only as the scores of the group reporting little or no specific pain were uninformative on this variable.

Pain-related fear and avoidance

As illustrated in Table 1., the groups differed significantly with regards to the four subscales of the PASS (fearful appraisals, cognitive anxiety, physiological anxiety, escape/avoidance). Tukey's HSD post-hoc analyses revealed that the clinic-referred chronic pain patients reported significantly higher scores on the PASS fearful appraisals subscale, PASS cognitive anxiety subscale, PASS physiological anxiety subscale, and the PASS escape/avoidance behaviour subscale, as compared with respondents from the community-based pain group and the group reporting little or no specific pain (all $p < 0.05$). Post-hoc analyses also revealed that the community-based pain group differed significantly from the group reporting little or no pain only in terms of their elevated score on the PASS fearful appraisals subscale ($p < 0.05$) and not with regards to the other subscales of the PASS.

Anxiety sensitivity

Analysis of variance on anxiety sensitivity scores indicated a group main effect for both the fear of somatic sensations and the fear of cognitive emotional dyscontrol subscales of the ASI. Tukey's HSD post-hoc analyses revealed that the clinic-referred chronic pain patients reported a significantly higher score on the ASI fear of somatic sensations subscale and the ASI fear of cognitive and emotional dyscontrol subscale than did respondents both from the community-based pain group and the group reporting little or no specific pain (all $p < 0.05$). Tukey's HSD post-hoc analyses did not reveal any significant differences between the community-based pain group and the group reporting little or no pain with regards to their scores

on the ASI fear of somatic sensations subscale or the fear of cognitive and emotional dyscontrol subscale of the ASI.

The groups also differed in terms of age, pain duration, and pain severity. Post-hoc analyses (Tukey's HSD) revealed that the clinic-referred chronic pain patients had a higher mean age than both the community-based pain group and the group reporting little or no specific pain ($p < 0.05$), although the two community-based groups did not differ significantly in age. The ANOVAs investigating between-group differences in pain duration and pain severity were performed using the clinic-referred chronic pain patients and the community-based pain group only since the scores provided by the group reporting little or no specific pain were relatively uninformative on these variables. As such, significant group differences were found for pain severity, but not for pain duration. These analyses indicated that the clinic-referred chronic pain patients reported higher pain severity than the community-based group reporting pain.

Controlling for pain severity

To investigate the degree to which the between-group differences in fear and avoidance were dependent on or independent of pain severity, an analysis of covariance (ANCOVA) was performed on the self-report measures, once more using group membership as the independent variable with pain severity the covariate. For the analysis, cells were again weighted by their sample sizes to adjust for unequal n. After adjustment by pain severity, the groups only remained significantly different

on PASS cognitive anxiety $F(2, 164) = 9.06$, $p < 0.001$; fear of negative evaluation $F(2, 164) = 4.50$, $p < 0.05$; SAD social distress $F(2, 164) = 5.23$, $p < 0.01$; SAD social avoidance $F(2, 164) = 4.37$, $p < 0.05$; and ASI fear of cognitive and emotional dyscontrol $F(2, 163) = 3.57$, $p < 0.05$. The groups did not differ significantly with regards to pain-related fearful appraisals, physiological anxiety, or escape/avoidance behaviour when pain severity was controlled for. The groups also no longer differed with regards to social phobia, agoraphobia, or ASI fear of somatic sensations when the effects of pain severity were controlled for. Post-hoc analyses, using Sidak's t test,[8] revealed that clinic-referred chronic pain patients reported significantly higher scores on the PASS cognitive anxiety subscale and the fear of negative evaluation scale than the community-based pain group and the group reporting little or no pain (all $p < 0.05$). Furthermore, Sidak's post-hoc t test revealed that the clinic-referred chronic pain patients reported higher scores on the SAD social distress subscale, SAD social avoidance, and the ASI fear of cognitive and emotional dyscontrol than the community-based pain group (all $p < 0.05$). Again, no significant differences were found between the community-based pain group and the group reporting little or no pain in these post-hoc analyses.

A further ANCOVA was conducted on the significant between-group effects with the addition of anxiety sensitivity (both subscales of the ASI) as a second covariate in the analysis. These analyses were intended to explore the degree to which anxiety sensitivity (i.e., the fear of anxiety-related bodily sensations) impacts

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[8] Tukey's adjustment is not available in SPSS for post-hoc pairwise comparisons with covariates (Tabachnick & Fidell, 2001). Consequently, Sidak's t test was chosen as it adjusts the significance level for multiple comparisons and provides tighter bounds than Bonferroni.

upon reports of both pain-related anxiety and social anxiety/avoidance. After adjustment by both pain severity and anxiety sensitivity, the groups differed only with regards to cognitive anxiety (PASS) $F(2, 161) = 6.36$, $p < 0.01$ and social distress $F(2, 161) = 3.45$, $p < 0.05$. Sidak's post-hoc t test revealed that the clinic-referred chronic pain patients remained higher in pain-related cognitive anxiety as compared with the community-based pain group and the group reporting little or no pain, when controlling for pain severity and anxiety sensitivity ($p < 0.01$). Post-hoc analyses also revealed that although there was a significant group effect for social distress the pairwise comparisons of group differences did not reach significance.

In summary, these results indicate that once the effects of pain severity were taken into account between-group differences disappeared with regards to pain-related anxiety and avoidance (with the exception of cognitive anxiety), agoraphobic fears, and fear of somatic sensations. However, the clinic-referred chronic pain patients remained higher in fear of negative evaluation, social distress, social avoidance, fear of cognitive and emotional dyscontrol, and pain-related cognitive anxiety than the community-based pain group, even after controlling for the effects of pain severity. Furthermore, when the effects of anxiety sensitivity were controlled for group effects disappeared, with the exception of pain-related cognitive anxiety and social distress.

Correlates of social anxiety and avoidance

Several additional analyses[9] were performed in order to explore the nature and extent of the association between pain-related anxiety/avoidance and social anxiety/avoidance, primarily in relation to the clinic-referred chronic pain patients and the community-based pain respondents (see Table 2. and 3.).[10]

Pain-related anxiety and avoidance

With regards to the clinic-referred chronic pain patients, significant Pearson product moment correlations were observed between the SAD social distress subscale and only the cognitive anxiety subscale of the PASS. Both the SAD social avoidance subscale and the fear of negative evaluation scale showed a similar pattern of correlations with fear and avoidance measures as the social distress subscale of the SAD. In addition, social avoidance was significantly related to the PASS escape/avoidance subscale. The SAD social distress, the SAD social avoidance, and the FNE scale, were not significantly associated with the PASS fearful appraisals subscale, the PASS physiological anxiety subscale, or the PASS escape/avoidance subscale. The measure of social fear/avoidance used in previous studies, the social phobia subscale of the FQ, was significantly correlated with the PASS fearful appraisals, the PASS cognitive anxiety, and the FQ agoraphobia subscale. No significant correlations were found between any measures of social anxiety/avoidance and pain severity or duration.

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[9] All univariate outliers were removed from analyses involving correlations and partial correlations.

Table 2. Simple correlations between the self-report measures provided by the clinic-referred chronic pain patients.

Measure	FA^{PASS}	CA^{PASS}	PA^{PASS}	EA^{PASS}	FNE	SD^{SAD}	SA^{SAD}	SP^{FQ}	BI^{FQ}	AG^{FQ}	SS^{ASI}	CE^{ASI}	SEV	DUR
FA^{PASS}	-													
CA^{PASS}	.70**	-												
PA^{PASS}	.65**	.69**	-											
EA^{PASS}	.31*	.32*	.55**	-										
FNE	.28	.45**	.10	-.05	-									
SD^{SAD}	.24	.41*	.23	.10	.60**	-								
SA^{SAD}	.21	.41*	.28	.32*	.50**	.77**	-							
SP^{FQ}	.37*	.31*	.28	.12	.36*	.57**	.55**	-						
BI^{FQ}	.24	.13	.26	.20	-.14	-.05	-.01	.27	-					
AG^{FQ}	.27	.25	.36*	.40*	.19	.19	.35*	.58**	.46*	-				
SS^{ASI}	.48**	.62**	.47*	.33*	.49**	.59*	.53**	.41**	-.02	.20	-			
CE^{ASI}	.50**	.57**	.44*	.21	.68**	.56**	.56**	.50**	-.03	.27	.74**	-		
SEV	-.03	-.36*	.03	.15	-.14	.00	.05	.18	.16	.05	-.21	-.03	-	
DUR	-.01	-.10	.14	.01	-.13	-.17	-.01	-.05	.40*	.05	-.30*	-.20	.19	-

Note: FA^{PASS} = PASS fearful appraisals; CA^{PASS} = PASS cognitive anxiety; PA^{PASS} = PASS physiological anxiety; EA^{PASS} = PASS escape/avoidance behaviour; FNE = Fear of Negative Evaluation; SD^{SAD} = SAD social distress; SA^{SAD} = SAD social avoidance; SP^{FQ} = FQ social phobia; BI^{FQ} = FQ blood/injury phobia; AG^{FQ} = FQ agoraphobia; SS^{ASI} = ASI fear of somatic sensations; CE^{ASI} = ASI fear of cognitive and emotional dyscontrol; SEV = Average pain severity rating; DUR = Duration of pain; ^{PASS} = subscale of the Pain Anxiety Symptoms Scale; ^{SAD} = subscale of the Social Avoidance and Distress scale; ^{FQ} = subscale of the Fear Questionnaire; ^{ASI} = subscale of the Anxiety Sensitivity Index.

$^{*}p < 0.05$; $^{**}p < 0.01$. All p values two-tailed.

Table 3. Simple correlations between the self-report measures provided by the community-based pain group.

Measure	FA^{PASS}	CA^{PASS}	PA^{PASS}	EA^{PASS}	FNE	SD^{SAD}	SA^{SAD}	SP^{FQ}	BI^{FQ}	AG^{FQ}	SS^{ASI}	CE^{ASI}	SEV	DUR
FA^{PASS}	-													
CA^{PASS}	.67**	-												
PA^{PASS}	.64**	.75**	-											
EA^{PASS}	.40**	.66**	.58**	-										
FNE	.36*	.23	.31*	-.05	-									
SD^{SAD}	.26*	.08	.14	-.02	.45**	-								
SA^{SAD}	.29*	.08	.09	.00	.38**	.88**	-							
SP^{FQ}	.43**	.31*	.31*	.12	.62**	.54**	.50**	-						
BI^{FQ}	.63**	.58**	.56**	.40**	.35*	.12	.18	.43**	-					
AG^{FQ}	.39*	.47**	.42**	.23	.27*	.34*	.31*	.54**	.39**	-				
SS^{ASI}	.66**	.58**	.51**	.35*	.42**	.25*	.23	.41**	.51**	.45**	-			
CE^{ASI}	.70**	.70**	.64**	.41**	.41**	.15	.17	.29*	.50**	.29*	.79**	-		
SEV	.27*	.17	.27*	.04	.13	.10	.02	.05	.12	.13	.12	.31*	-	
DUR	-.14	.08	.08	.14	-.12	-.07	-.12	-.13	-.15	-.12	-.18	-.06	.13	-

Note: FA^{PASS} = PASS fearful appraisals; CA^{PASS} = PASS cognitive anxiety; PA^{PASS} = PASS physiological anxiety; EA^{PASS} = PASS escape/avoidance behaviour; FNE = Fear of Negative Evaluation; SD^{SAD} = SAD social distress; SA^{SAD} = SAD social avoidance; SP^{FQ} = FQ social phobia; BI^{FQ} = FQ blood/injury phobia; AG^{FQ} = FQ agoraphobia; SS^{ASI} = ASI fear of somatic sensations; CE^{ASI} = ASI fear of cognitive and emotional dyscontrol; SEV = Average pain severity rating; DUR = Duration of pain; ^{PASS} = subscale of the Pain Anxiety Symptoms Scale; ^{SAD} = subscale of the Social Avoidance and Distress scale; ^{FQ} = subscale of the Fear Questionnaire; ^{ASI} = subscale of the Anxiety Sensitivity Index.

$^{*}p < 0.05$; $^{**}p < 0.01$. All p values two-tailed.

The most notable differences in the pattern of correlations from the community-based pain group (as compared with the clinic-referred chronic pain patients) was the presence of positive correlations between the social distress and avoidance subscales of the SAD and the PASS fearful appraisals subscale (frequently used as a measure of fear of pain). Significant correlations were also observed between the fear of negative evaluation scale and the PASS fearful appraisals subscale and the PASS physiological anxiety. The social phobia subscale of the FQ was significantly correlated with the PASS fearful appraisals, the PASS cognitive anxiety, the PASS physiological anxiety, and the FQ agoraphobia subscale. Again, no significant correlations were found between any measures of social anxiety/avoidance and pain severity or duration.

Anxiety sensitivity

Significant Pearson product moment correlations were observed between the SAD social distress subscale and the ASI fear of somatic sensations and the ASI fear of cognitive and emotional dyscontrol, in the group of clinic-referred chronic pain patients. Again, the SAD social avoidance subscale and the fear of negative evaluation scale showed a similar pattern of correlations with the two dimensions of the ASI as the social distress subscale of the SAD. In addition, the social phobia subscale of the FQ, was significantly correlated with the ASI fear of cognitive and emotional dyscontrol.

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[10] See appendix 9 for the simple correlations of the self-report measures provided by the community-based group reporting little or no specific pain.

With regards to the community-based pain group, the correlations between the two subscales of the SAD and the two subscales of the ASI were noticeably smaller than was observed in the clinic-referred chronic pain group, although the fear of negative evaluation scale was significantly correlated with both subscales of the ASI. The social phobia subscale of the FQ was significantly correlated with the ASI fear of somatic sensations and the ASI fear of cognitive and emotional dyscontrol.

In addition to the results reported above, with regards to the clinic-referred chronic pain patients, the subscales of the PASS measuring pain-related anxiety (i.e., fearful appraisals, cognitive anxiety, and physiological anxiety) were all significantly correlated with the two subscales of the ASI (fear of somatic sensations and fear of cognitive emotional dyscontrol). In addition, the PASS escape/avoidance subscale was positively correlated with the ASI fear of somatic sensations. Cognitive anxiety was the only subscale of the PASS to achieve a significant negative correlation with pain severity. No significant correlations were found between any pain-related cognitive/affective measures and pain duration. Pain duration was, however, found to have a negative correlation with the ASI fear of somatic sensations subscale.

With regards to the community-based pain group, the pattern of correlations between the subscales of the PASS and the subscales of the ASI were similar to those reported for the clinic-referred chronic pain patients, with high positive correlations between each of the variables. Furthermore, small yet significant positive correlations were observed between pain severity and the PASS fearful appraisals subscale, the PASS physiological anxiety subscale, and the ASI fear of

cognitive and emotional dyscontrol. No significant correlations were found between pain duration and the other variables in the present study.

The inter-correlations between the measures of social anxiety and avoidance were similar for the three groups. Specifically, the social phobia subscale of the FQ was significantly related to the fear of negative evaluation scale (r = 0.36 to 0.62, all $p < 0.01$), and the SAD social distress and avoidance subscales (r = 0.47 to 0.57, all $p < 0.01$; r = 0.42 to 0.55, all $p < 0.01$, respectively). The fear of negative evaluation scale was significantly correlated with SAD social distress (r = 0.38 to 0.60, all $p < 0.01$) and SAD social avoidance (r = 0.38 to 0.50, all $p < 0.01$). The SAD social avoidance and distress subscales correlated most highly with each other (r = 0.64 to 0.88, all $p < 0.01$).

Partial correlations

In order to explore the strength of the associations between social anxiety/avoidance and pain-related cognitive/affective variables the effects of pain severity were controlled for. With regards to the correlates of social anxiety and avoidance in the clinic-referred chronic pain group and the community-based pain group[11], partial correlations (controlling for pain severity) did not differ substantially from those reported in Table 2. (see Table 4.). Overall, the partial correlations were

[11] See appendix 10 and 11 for partial correlations of the self-report measures provided by the community-based group reporting little or no specific pain.

Table 4. Comparisons of simple and partial correlations (controlling for pain severity) between measures of social anxiety/avoidance and pain-related cognitive/affective variables provided by the clinic-referred chronic pain group and the community-based pain group.

	Chronic pain patients						Community pain group					
	FNE		Social distress^{SAD}		Social avoidance^{SAD}		FNE		Social distress^{SAD}		Social avoidance^{SAD}	
Measure	Simple *r*	Partial *r*	Simple *r*	Partial *r*	Simple *r*	Partial *r*	Simple *r*	Partial *r*	Simple *r*	Partial *r*	Simple *r*	Partial *r*
Fearful appraisals^{PASS}	.28	.27	.24	.24	.21	.21	.36*	.34*	.26*	.25	.29*	.29*
Cognitive anxiety^{PASS}	.45**	.43**	.41**	.44*	.41**	.46**	.23	.21	.08	.07	.08	.07
Physiological anxiety^{PASS}	.10	.11	.23	.23	.28	.27	.31*	.29*	.14	.12	.09	.09
Escape/avoidance^{PASS}	-.05	-.03	.10	.10	.32*	.31*	-.05	-.06	-.02	-.03	.00	.00
Fear of somatic sensations^{ASI}	.49**	.48**	.59**	.60**	.53**	.55**	.42**	.41**	.25*	.24	.23	.23
Fear of cognitive & emotional dyscontrol^{ASI}	.68**	.68**	.56**	.56**	.56**	.56**	.41**	.39**	.15	.13	.17	.17

Note: FNE = Fear of Negative Evaluation scale; ^{PASS} = subscale of the Pain Anxiety Symptoms Scale; ^{SAD} = subscale of the Social Avoidance and Distress scale; ^{ASI} = subscale of the Anxiety Sensitivity Index.

$^{*}p < 0.05$; $^{**}p < 0.01$. All *p* values two-tailed.

Table 5. Comparisons of simple and partial correlations (controlling for anxiety sensitivity) between measures of social anxiety/avoidance and pain-related cognitive/affective variables provided by the clinic-referred chronic pain group and the community-based pain group.

	Chronic pain patients						Community pain group					
	FNE		Social distress^{SAD}		Social avoidance^{SAD}		FNE		Social distress^{SAD}		Social avoidance^{SAD}	
Measure	Simple *r*	Partial *r*	Simple *r*	Partial *r*	Simple *r*	Partial *r*	Simple *r*	Partial *r*	Simple *r*	Partial *r*	Simple *r*	Partial *r*
Fearful appraisals^{PASS}	.28	-.10	.24	-.12	.21	-.14	.36**	.08	.26*	.17	.29*	.21
Cognitive anxiety^{PASS}	.45**	.12	.41**	.03	.41**	.07	.23	-.10	.08	-.05	.08	-.07
Physiological anxiety^{PASS}	.10	-.30	.23	-.10	.28	-.01	.31*	.07	.14	.06	.09	-.02
Escape/avoidance^{PASS}	-.05	-.27	.10	-.11	.32	.21	-.05	-.28*	-.02	-.11	.00	-.08

Note: FNE = Fear of Negative Evaluation scale; ^{PASS} = subscale of the Pain Anxiety Symptoms Scale; ^{SAD} = subscale of the Social Avoidance and Distress scale.

*p <0.05; **p < 0.01. All p values two-tailed.

smaller than the simple correlations, although the majority of relationships remained significant.

To further investigate the nature of the relationship between pain-related anxiety/avoidance and social anxiety/avoidance partial correlations were also done whilst controlling for anxiety sensitivity (i.e., fear of anxiety-related bodily sensations). Results indicate that, when anxiety sensitivity is controlled for, there is no longer a significant relationship between the PASS cognitive anxiety subscale and the three related measures of social anxiety/avoidance (i.e., fear of negative evaluation, social distress and avoidance subscales of the SAD) in clinic-referred chronic pain patients (see Table 5.). Likewise, the significant correlations between the PASS fearful appraisals subscale and the three related measures of social anxiety (reported in Table 3.) for the community-based pain group were no longer significant when the effects of anxiety sensitivity were controlled for. Results also suggest that, whilst controlling for anxiety sensitivity, the negative correlation between the fear of negative evaluation scale and the PASS escape/avoidance subscale was increased and consequently reached significance.

Discussion

Discussion

Fear and avoidance models of chronic pain suggest, in general, that there is a reciprocal relationship between fear and avoidance that serves to maintain maladaptive pain behaviour and disability over a prolonged period. Evidence confirming the postulates of the fear and avoidance models is mounting (Asmundson et al., 1999a; Vlaeyen & Linton, 2000). In addition to fear about pain, evidence suggests that patients with persistent pain are more likely to fear stimuli or experiences that are not directly related to the pain (Asmundson et al., 1999a). In particular, a number of studies have documented the presence of elevated social fears in patients with chronic musculoskeletal pain (Asmundson et al., 1996a,b; Vlaeyen et al., 1995a). The present study was interested in determining the extent and nature of the social anxiety and avoidance reported by patients with chronic pain, in addition to the impact of certain variables upon one's propensity to be(come) fearful of both pain and social interactional situations. In particular, anxiety sensitivity (i.e., the fear of anxiety related sensations; Reiss & McNally, 1985) has been implicated in the development of both a fear of pain (Asmundson & Taylor, 1995) and other non-pain fears (Reiss, 1991; Taylor, 1995). Furthermore, the present study was interested in the relationships between social anxiety and avoidance and pain-related cognitive/affective variables, in those experiencing pain.

Summary of the main findings

In agreement with previous research documenting elevated social fears in chronic pain patients (Asmundson et al., 1996a,b; Vlaeyen et al., 1995a), the present study found that clinic-referred chronic pain patients consistently report higher levels of social distress (e.g., "I often find social occasions upsetting"), social avoidance (e.g., "I tend withdraw from people"), and fear of negative evaluation (e.g., "I am frequently afraid of other people noticing my shortcomings") as compared with a community-based pain group and a group reporting little or no specific pain (healthy controls). With regards to the measure of social fears used in previous studies (i.e., the social phobia subscale of the Fear Questionnaire; Asmundson et al., 1996a,b) results from the present study were less consistent. Although the clinic-referred chronic pain patients were found to report higher social phobia than healthy controls, the level of these fears were not significantly higher than the community-based group reporting pain.

Social distress, social avoidance, and fear of negative evaluation were not significantly associated with pain severity in any of the groups. As such, the between-group differences found in social distress, social avoidance, and fear of negative evaluation remained stable after controlling for the effects of pain severity. These results suggest that the high levels of social anxiety and avoidance exhibited by clinic-referred chronic pain patients, relative to controls, cannot be explained by the elevated pain severity they report.

As predicted, the findings from the present study suggest that reports of elevated social anxiety and avoidance in clinic-referred chronic pain patients are associated with a predispositional tendency to respond fearfully to anxiety-related bodily sensations (i.e., anxiety sensitivity). Specifically, elevated levels of social distress, social avoidance and fear of negative evaluation in clinic-referred chronic pain patients, in particular, were strongly related to high levels of anxiety sensitivity (both dimensions of fear of somatic sensations and fear of cognitive and emotional dyscontrol). These relationships were observed to a much lesser degree in the community-based groups, with significant correlations found primarily between fear of negative evaluation and anxiety sensitivity.

In addition to these relationships, the clinic-referred chronic pain patients reported a higher level of anxiety sensitivity (on both dimensions of fear of somatic sensations and fear of cognitive and emotional dyscontrol) relative to community-based groups reporting some or no pain. As a result, prior group differences in social distress, social avoidance, and fear of negative evaluation disappeared, when the effects of anxiety sensitivity were taken into account (in addition to pain severity). These results imply that the group differences found in social anxiety and avoidance were related to the degree to which clinic-referred chronic pain patients feared or fearfully appraised sensations related to anxiety.

Interestingly, and in contrast to patients with chronic pain related to musculoskeletal injury, the mean Anxiety Sensitivity Index (Peterson & Reiss, 1992) score for the clinic-referred chronic pain patients in the present study was higher than the normative mean and the means for obsessive-compulsive disorder,

generalised anxiety disorder, social phobia, specific phobia, and somatoform disorders (Cox et al., 1998; Taylor et al., 1992). In the present study, the group difference found on the fear of somatic sensations dimension of the Anxiety Sensitivity Index disappeared when pain severity was controlled for. As such, the elevated total score on the Anxiety Sensitivity Index may have been due, in part, to the level of pain severity experienced by the chronic pain patients in this study. This suggests that although on average the patients seeking or being referred for treatment at one of the pain services in New Zealand may have an amplified tendency to be(come) fearful and avoidant of a multitude of stimuli (Reiss, 1991) this may in part be due to the severity of their pain. However, scores on the Anxiety Sensitivity Index for both the healthy controls reporting little or no specific pain and the community-based pain group also exceeded the normative mean Anxiety Sensitivity Index score, and were comparable to means for phobic populations. These preliminary results suggest that on average New Zealanders respond differently from the normative and phobic samples within the United States and Canada, tending toward higher endorsement of certain items on the Anxiety Sensitivity Index.

Implications

The present study sought to expand on initial research suggesting that chronic pain patients exhibit elevated social fears relative to controls (Asmundson et al., 1996b; Vlaeyen et al., 1995a). The use of more comprehensive measures of social anxiety and avoidance, than was employed in previous research, has enabled the present study to confirm that social distress and avoidance, and fear of negative

evaluation are indeed an additional problem for many patients with chronic pain who seek specialist treatment for their pain. The present study also confirmed that the trend towards elevated social anxiety and avoidance in clinic-referred patients with chronic pain is not observed in a sub-clinical or community-based pain group. In addition, the notion that clinic-referred chronic pain patients are generally more fearful as compared with controls was supported by the present finding that anxiety sensitivity is elevated in these patients. The contention that anxiety sensitivity is related to general fearfulness (Reiss, 1991) was confirmed by the strong association between the three related dimensions of social anxiety and anxiety sensitivity in the clinic-referred chronic pain patients. Furthermore, the consistency and magnitude of the associations observed in the group of clinic-referred chronic pain patients, relative to the relationships observed in the control groups, suggests that anxiety sensitivity is a particularly salient trait for those experiencing chronic pain.

The source of the social anxiety and avoidance exhibited by clinic-referred chronic pain patients may only be speculated upon at this time. As suggested by Asmundson and colleagues (1996a,b), social anxiety co-occurring with a chronic medical condition may, in some circumstances, involve perceptions of illness- and/or injury-related compromises in physical prowess and hence, beliefs of increased social scrutiny. For example, the social phobia observed in patients with Parkinson's Disease reportedly developed after they began experiencing the symptoms of the disease (Stein, Housor, & Uhde, 1990). Conversely, Asmundson and colleagues (1996a) report that the social phobia observed in patients with chronic musculoskeletal pain always preceded injury with onset during childhood or

adolescence. Thus, despite the debilitating effects of chronic musculoskeletal pain, beliefs of compromised physical prowess and increased social scrutiny do not appear to best account for the occurrence of social phobia in this instance. However, sub-clinical social anxiety and avoidance may still develop from a fear that others will fail to regard their illness or condition as legitimate, since often times there are no obvious signs of physical injury or pathology in patients with chronic pain.

Alternatively, the elevated social fears exhibited by chronic pain patients may have preceded the initial injury. That is, the presence of social anxiety and avoidance in chronic pain patients may be less related to the pain and more associated with a premorbid fear of negative evaluation and social interactions. As such, these social fears may have predisposed the individual toward developing a chronic pain syndrome subsequent to an acute injury. The contention that social anxiety represents a risk factor for developing a chronic pain syndrome subsequent to an acute injury is somewhat supported by the notion that vulnerability to social phobia reflects a general vulnerability to anxiety disorders as a group (Davidson et al., 1993).

Consequently, socially anxious individuals may be at risk from developing exaggerated pain-related anxiety and associated avoidance behaviour following an acute injury. This vulnerability or predisposition toward developing maladaptive pain-related anxiety might be explained by the well-documented negative penchant typical of socially anxious individuals. Specifically, the cognitive operations of socially anxious individuals are characterised by self-focused attention and negative appraisals of their self and social judgements (Alden & Wallace, 1995; Mellings &

Alden, 2000). As such, the propensity to appraise experiences and situations in a negative and highly self-focused manner may predispose an individual with pain to develop maladaptive thoughts about pain and the associated avoidance behaviour considered to contribute to disability (Vlaeyen & Linton, 2000; Vlaeyen et al., 1995a,b). This proposed link between social anxiety and negative affect is intimated in the present study by the consistent relationships observed between the three related dimensions of social anxiety and anxiety sensitivity in chronic pain patients.

Equally, however, the psychological distress that typically accompanies chronic pain (i.e., depression) may be responsible for increased the self-focus, self-criticism, and social distress and avoidance reported by chronic pain patients. As such, injury or acute pain may initially prevent an individual from attending social occasions and gatherings which, coupled with a propensity toward fearfulness and negative affect, may begin a social disuse syndrome, exacerbating anxieties about social interactions and adding to feelings of depression. In sum, the relationship between chronic pain and social anxiety and avoidance is a complex one, not easily explained by cross-sectional correlational research.

In the past, there has been a lack of research exploring the association between social anxiety and avoidance and pain-related fears. The only study documenting a relationship between social fears and a fear of movement/(re)injury found a positive association in chronic low back pain patients (Vlaeyen et al., 1995a). Thus, the present study anticipated that high levels of social anxiety and

avoidance would be associated with elevated pain-related anxiety. These predictions were only partially confirmed in the groups experiencing pain. With respect to the clinic-referred chronic pain patients, social distress, social avoidance, and fear of negative evaluation were strongly related to pain-related cognitive anxiety, but were not consistently associated with fear of pain, physiological anxiety about pain, or pain-related escape or avoidance behaviour. Expressly, individuals reporting high levels of social distress, social avoidance, and fear of negative evaluation also reported high levels of cognitive anxiety about pain. In addition, high levels of social avoidance were related to reports of elevated pain-related escape or avoidance behaviour, in these patients. Unlike the other measures of social anxiety, the social phobia subscale of the Fear Questionnaire exhibited a slightly different pattern of relationships with pain-related anxiety. Specifically, high scores on the measure of social phobia were also related to reports of an elevated fear of pain as well as high cognitive anxiety about pain, in clinic-referred chronic pain patients.

With regards to the community-based pain group, individuals with high levels of social distress, social avoidance, and fear of negative evaluation also reported an elevated fear of pain. These related facets of social anxiety were not consistently associated with other dimensions of pain-related anxiety or avoidance. However, individuals reporting a high fear of negative evaluation also reported high physiological anxiety about pain. Again, high scores on the social phobia subscale of the Fear Questionnaire were related to a number of pain-related dimensions, in particular, a high fear of pain, and elevated cognitive and physiological anxiety about pain.

The observed relationships between social distress, social avoidance, and fear of negative evaluation and pain-related anxiety and avoidance in both the clinic-referred chronic pain patients and the community-based pain group remained stable even after taking into account the effects of pain severity.

Derived from research suggesting that anxiety sensitivity is related to fearfulness in general (Reiss, 1991; Taylor, 1995) and fear of pain specifically (Asmundson & Taylor, 1996), the relationship between pain-related anxiety and social fears was anticipated to be dependent on anxiety sensitivity, such that when the propensity to fear anxiety-related somatic sensations was taken into account pain-related anxiety and social anxiety would no longer be related. The present results confirmed this hypothesis: when the effects of anxiety sensitivity were accounted for in the relationship between social anxiety/avoidance and pain-related anxiety this association was no longer evident in those experiencing pain.[12]

As might be expected, the present study also found that clinic-referred chronic pain patients reported higher levels of pain-related anxiety and avoidance, as compared with controls. Specifically, clinic-referred chronic pain patients were found to experience higher levels of pain-related fear (e.g., "When I feel pain, I become afraid of dying"), higher levels of cognitive (e.g., "I can't think straight when in pain") and physiological (e.g., "Pain seems to cause my heart to pound or race") anxiety about pain, and elevated pain-related avoidance (e.g., "I avoid important activities when I hurt") as compared with a community-based pain group or healthy controls.

However, research suggests that the pain-related fearfulness characteristic of an individual with chronic pain appears to occur relatively independently of the pain severity experienced (e.g., Waddell et al., 1993). As such, the present study hypothesised that between-group differences in pain-related anxiety and avoidance would remain stable after the effects of pain severity were controlled for. The present results refuted this hypothesis, finding that pain severity significantly tempered the differences between the groups in pain-related anxiety and avoidance, such that when pain severity was controlled for between-group differences only continued to exist with regards to pain-related cognitive anxiety.

Evidently, cognitive anxiety about pain remained elevated in clinic-referred chronic pain patients, even after pain severity was controlled for, in part because it was negatively correlated with pain severity in the chronic pain patients. This finding is relatively anomalous since it suggests that patients in the clinic-referred chronic pain sample who were high in cognitive anxiety about pain typically reported lower levels of pain severity. Accordingly, patients who are experiencing higher levels of pain severity may report less cognitive anxiety about pain in part because they have become habituated to the level of pain they experience and/or have developed the ability to cope with the pain through distraction from it (Devine & Spanos, 1990; Eccleston, 1995).

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[12] The mitigating effect of anxiety sensitivity on the relationship between social anxiety/avoidance and pain-related anxiety was also evident in the community-based group reporting little or no pain (see appendix 11).

Implications

The inconsistencies present in the pattern of relationships observed between social anxiety/avoidance and pain-related anxiety, in the clinic-referred chronic pain patients, were somewhat unexpected. There was a strong relationship evident between social distress, social avoidance, fear of negative evaluation, and cognitive anxiety about pain in clinic-referred chronic pain patients that was not observed with regards to other measures of pain-related anxiety (i.e., fear of pain, physiological anxiety about pain). Although the clinic-referred chronic pain patients with high social anxiety/avoidance also reported elevated fear of pain this relationship was not statistically significant. As such, the unique relationship between the three related dimensions of social anxiety and cognitive anxiety about pain suggests that the two, seemingly independent, sets of fears are motivated by the same cognitive style. That is, the negative penchant typical of a socially anxious individual may encourage the inability to distract attention from the pain.[13] This notion will be discussed further in relation to the stable between-group differences found in pain-related cognitive anxiety.

To an extent, the present findings, regarding the dependence of certain aspects of pain-related anxiety on pain severity, contradict the findings of previous studies, which imply that pain-related anxiety and avoidance occur relatively independently of pain severity (e.g., Waddell et al., 1993). However, the stable group difference in pain-related cognitive anxiety, even after the effects of pain severity and anxiety sensitivity were accounted for, warrants some discussion. Evidently,

what distinguished the clinic-referred chronic pain patients most from the community-based group reporting pain, in the present study, was their inability to distract attention away from the pain with items such as, "During painful episodes it is difficult for me to think of anything besides the pain" and "When I hurt, I think about the pain constantly" heavily endorsed.

Attentional processes have been shown to mediate the impact of anxiety on pain perception (Arntz, Dreessen, & de Jong, 1994). The consequences of chronic interruption of attention for many people with chronic pain has been linked with the development of a clinical pattern of high symptom reporting (Bacon, Bacon, Atkinson, Slater, Patterson, Grant, & Garfin, 1994), depression (Turk, Okifuji, & Scharff, 1995), widespread avoidance of pain and movement (Asmundson et al., 1997a; Crombez, Vervaet, Baeyens, Lysens, & Eelen, 1998; Eccleston, Crombez, Aldrich, & Stannard, 1997; McCracken, 1997), and, as evidenced from the present study, withdrawal from social contact. Furthermore, a study by Peters, Vlaeyen, and van Drunen (1999; cited in Vlaeyen & Linton, 2000) using a body scanning reaction paradigm found that detection latency for innocuous electrical stimuli in the arm was predicted by scores on the Pain Anxiety Symptoms Scale, and most consistently by the cognitive anxiety subscale, in patients with fibromyalgia. Thus, pain-related cognitive anxiety may lead to increased attention toward the source of threat, in this case bodily sensations.

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[13] Equally, however, the inconsistencies in the present findings may be an artefact, to some extent, of the small sample size.

Conversely, if considered with the finding that elevated pain-related cognitive anxiety is consistently and singularly associated with high levels of social anxiety/avoidance, the elevated cognitive anxiety about pain reported by the clinic-referred chronic pain patients in the present study may be related to the negative self-focus characteristic of a socially anxious individual. That is, the negative penchant and self-focus typical of an individual with both social anxiety and, as evidenced in this study, high anxiety sensitivity might function as a non-specific vulnerability factor, predisposing the individual toward developing other anxieties salient to their situation. Specifically, the inability to distract attention away from the pain may be influenced by a more general propensity to be self-focused, biased toward negative self-related information, and generally high in negative affect. The finding that the cognitive anxiety subscale of the Pain Anxiety Symptoms Scale is strongly related to the Beck Depression Inventory (McCracken et al., 1992) supports this contention. Cognitive anxiety about pain has also been related to decreased frequency of cognitive coping strategies and a diminished sense of control over pain (McCracken & Gross, 1993).

Finally, the present results suggest that the community-based pain group and the healthy controls did not differ significantly on measures of fear and avoidance. Although, the community-based pain group did report a higher fear of pain relative to the group reporting little or no specific pain. However, since the community-based groups differed absolutely on the presence or absence of pain, the finding that the community-based pain group exhibited higher fear of pain as compared with healthy controls may merely reflect differences in the experience of pain, and not any

fundamental psychological differences between the two groups. The absence of any notable differences between the community-based groups, except on pain severity and duration, emphasises that the presence and duration of pain per se does not lead to chronic pain, but individual reaction to it.

General implications for chronic pain

To date, research on social anxiety and avoidance in patients with chronic pain has been relatively limited (Asmundson et al., 1996a,b; Dalton & Feuerstein, 1989; Vlaeyen et al., 1995a). As such, the impact of increased social distress, social avoidance and fear of negative evaluation on the chronic pain syndrome has not yet been documented. However, chronic musculoskeletal pain patients with a comorbid anxiety problem have been shown to report considerably more psychological distress than those patients without psychiatric diagnosis (Asmundson et al, 1996a). Although causal attributions certainly cannot be made in the present study, the initial findings suggest that the negative self-focus characteristic of a socially anxious individual may, subsequent to an acute injury, contribute to an inability to distract attention away from the pain. Equally, the inability to distract attention away from the pain may function to increase self-focus and as such concerns about how others might view a chronic pain patient with no obvious injury or illness. Regardless of the causal direction of this relationship, elevated social anxiety and avoidance in patients with chronic pain will no doubt promote further avoidance of daily activities,

maintain or exacerbate habitual levels of anxiety, add to problems with self-esteem, and likely maintain depressive symptoms.

The importance of individual sensitivity to anxiety-related somatic sensations has been implicated in both the maintenance of social anxiety disorder (Mansell & Clark, 1999; Wells & Papageorgiou, 2001) and the development of an exaggerated fear of pain (Asmundson & Norton, 1995; Asmundson & Taylor, 1996). As such, socially anxious chronic pain patients would likely benefit from treatments designed to reduce sensitivity to anxiety-related symptoms.

Since anxiety sensitivity was originally proposed as an explanation for panic disorder therapies naturally comprise those proposed for this disorder (e.g., Craske & Barlow, 1989). These therapies may include: breathing retraining; relaxation training; cognitive restructuring; exposure to feared somatic stimuli; and/or exposure to feared external stimuli (Davey, 1997). Evidently, similar techniques are already in use for the treatment of patients with chronic pain (e.g., Herman & Baptiste, 1990; Murphy, Tosi, Parisen, 1989; Turk & Melzack, 1992; Vlaeyen, de Jong, Geilen, Heuts, & van Breukelen, 2001).

In particular, gradual expose to the salient sources of perceived threat for people without pain who are distressed and disabled by a generalised fear or phobia has proven to be an effective component to treatment (Davey, 1997). Only recently, has graded exposure been applied to patients with chronic musculoskeletal pain (Vlaeyen et al., 2001). The study found that graded exposure in vivo treatment with behavioural experiments reduced pain-related fear and as such lead to decreases in pain catastrophising and pain disability. Similarly, any reduction in the levels of

anxiety sensitivity (i.e., a fear of fear) experienced by an individual with chronic pain is expected to be associated with a reduction in the tendency to catastrophise symptoms of arousal associated with anxiety and pain (Asmundson et al., 1999).

Consequently, the most essential step should involve a tangible strategy that is oriented towards a gradual resumption of daily activities, including work and social activities. This type of exposure is akin to the graded activity programs in that it gradually increases activity levels despite the pain. However, such a program also emphases the importance of confronting personally relevant and specific pain-related feared stimuli (Crombez et al., 1999). Exposure to feared situations and experiences should allow and encourage the pain patient to disconfirm the negative expectancies and beliefs about pain, and perhaps social situations, that are thought to maintain the maladaptive avoidance behaviour considered to lead to chronicity (Vlaeyen & Linton, 2000).

Limitations

The present study employed the Fear Questionnaire, in addition to more specific measures of social anxiety and avoidance, in order that comparison could be made with previous studies reporting elevated scores on the social phobia subscale of this measure in a chronic pain population (Asmundson et al., 1996a,b). However, the social phobia subscale of the Fear Questionnaire failed to discriminate the clinic-referred chronic pain patients from the community-based pain group, while the three

related measure of social anxiety consistently found differences between these groups.

The inconsistencies present in the between-group differences in social phobia were perhaps attributable to the presence of items in the social phobia subscale of the Fear Questionnaire that, while salient for individuals with clinical social phobia (i.e., eating or drinking with other people), might not be endorsed by an individual with sub-clinical social anxiety. Accordingly, Asmundson and colleagues (1996b) reported that a significant proportion of chronic pain patients reported definite avoidance of being watched/stared at and speaking/acting to an audience, but not definite avoidance of eating/drinking with others, talking with authority, or being criticised as compared with controls. Answers on the social phobia subscale of the Fear Questionnaire may also have been confounded by the item concerning speaking or acting to an audience, since it is not uncommon for individuals generally low in social anxiety to endorse items relating to this type of fear. For this reason scores on the social phobia subscale of the Fear Questionnaire may have been inflated for the two controls groups. Leary (1988) in fact states that the tendency to become nervous when speaking or performing before an audience is conceptually and empirically distinguishable from the tendency to experience anxiety in "contingent" social interactions (i.e., person-to-person *inter*actions).

The appropriateness of the Fear Questionnaire for use on a non-phobic population was also brought into question by the present finding that none of the groups were found to differ on levels of blood/injury phobia. To a certain degree, the inconsistencies found in the present study were reflected by the average-to-low scale

reliabilities found for both the social phobia and the blood/injury phobia subscales of the Fear Questionnaire. Furthermore, these inconsistencies highlight the disadvantages of assessing a construct using a lone measure.

Contrary to research suggesting that anxiety sensitivity represents a risk factor for developing an exaggerated fear of pain (Asmundson & Taylor, 1996), the nature of the relationship between anxiety sensitivity and social distress, social avoidance, and fear of negative evaluation is much less clear. Concern has in fact been expressed that the social concerns component of anxiety sensitivity[14] (as measured by the Anxiety Sensitivity Index) might be more appropriately conceptualised as belonging to the domain of negative evaluation sensitivity (Taylor, 1995).

Recent evidence suggests that the anxiety sensitivity social concerns factor is in fact distinct from negative evaluation sensitivity and taps a blend of anxiety sensitivity and negative evaluation sensitivity (McWilliams, Stewart, & MacPherson, 2000). Research assessing information biases in socially anxious individuals suggests that these people possess an enhanced awareness of potentially misleading interoceptive information, such as the bodily symptoms or sensations of anxiety (Clark & Wells, 1995; Mansell & Clark, 1999; Wells & Papageorgiou, 2001). Specifically, socially anxious individuals with high fear of negative evaluation use the perception of anxiety-related bodily sensations to overestimate how anxious they appear and underestimate how well they come across (Mansell & Clark, 1999).

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[14] The social concerns component of anxiety sensitivity was included in the cognitive and emotional dyscontrol factor used in the present study.

In this regard, socially anxious people would be expected to be higher in anxiety sensitivity, since measures of anxiety sensitivity tap the degree to which individuals fear the negative social, psychological, and physical consequences of symptoms of anxiety. Thus, the fear of anxiety-related somatic sensations may be motivated in certain individuals by a fear of negative evaluation. Equally, the appraisal of anxiety-related somatic sensations as threatening may be indicative of the catastrophic thinking and hypervigilance that often accompanies chronic pain (Asmundson, 1999), and as such is reducible to a more fundamental fear; that is, a fear of pain. The factor structure of the Anxiety Sensitivity Index (Peterson and Reiss, 1992) also suggests that the concept of anxiety sensitivity, when considered in relation to chronic pain patients and as measured by the Anxiety Sensitivity Index, can itself be explained by or reduced to the more fundamental fears of illness/injury (both physical and psychological) and negative evaluation. Evidently, more research and debate is required in order to delineate the role that anxiety sensitivity has in both the pain-related fear and avoidance and salient non-pain fears, such as social anxiety.

While comparison of clinic-referred chronic pain patients with community-based groups has some illustrative value with respect to levels of fear and avoidance, considerable caution should be employed when interpreting these results. At face value chronic pain patients and community-based groups differ only with regards to their experience of pain. With respect to the present study, the clinic-referred chronic pain patients differed from the community-based pain group on levels of pain severity, and not pain duration. However, the degree to which these two groups

differ on a number of other variables relating to the pain should not be overlooked. For example, the two groups of community-based respondents were essentially an opportunity sample taken from businesses in and around Palmerston North, and as a consequence the sample was biased toward those in employment. Although a quarter of the clinic-referred chronic pain patients were either in full- or part-time work, over half of these patients were unable to work because of the pain. While the present study showed that clinic-referred chronic pain patients remained higher in social anxiety and avoidance relative to controls, even after the effects of pain severity were taken into account, these differences could equally be attributed to the fundamental differences in lifestyle evident between these groups. Accordingly, in a study investigating depression in 254 chronic pain patients, work loss was shown to significantly impact upon self-esteem and was found to be the single biggest predictor of depression in these patients (as cited by Hunter, 2001).

Given the sampling strategy employed in the present study, the results of the present study are difficult to generalise to any particular chronic pain population since the makeup of the present chronic pain group was too varied with regards to their type of pain. Although approximately half of the clinic-referred chronic pain patients experienced chronic low back pain, a number of these patients reported additional types of pain, such as neck pain and headache. Researchers have been encouraged, by the complexity of the mechanisms by which chronic pain syndromes are initiated and maintained, to focus upon particular pain groups in their attempts to demarcate the variables that promote chronicity and differentiate between pain types. Consequently, a vast number of researchers have converged on the problem of

chronic low back pain in our society (e.g., McCracken et al., 1993; Vlaeyen & Linton, 2000; Vlaeyen et al., 1995a,b). Division of patients into groups of their respective pain types would, however, demand a far larger sample size, which was not available to the researcher within the timeframe given.

Future directions

The aforementioned conclusions are tentative and require more thorough investigation. In particular, structured interview assessments of patients' symptoms will be required to address the impact of social anxiety and avoidance on the maintenance of pain, suffering, and disability (Asmundson et al., 1996b). Interview-based assessments would also enable clinicians to garner retrospective estimates of symptom onset relative to precipitating injury. Furthermore, additional prospective studies following acute pain patients in primary care, which include well-established pain-related and social anxiety measures, are needed to help us understand the mechanisms that lead to chronic disability and associated psychological distress.

There may be some value in exploring whether the anxiety sensitivity model or an alternative, such as general negativity of affect, provides the most accurate account of the factors that influence non-pain fears. Trait negative affectivity is typically defined as a dimension that reflects stable and pervasive differences in negative mood and self-concept (Watson & Clarke, 1984). Persons with high negative affectivity are considered to be hypervigilent for all forms of (external and

internal) threat (Watson & Pennebaker, 1989). Accordingly, Eysenck (1992) argues that negative affectivity may be conceived of as a vulnerability factor for the development of specific fears.

Although in the past pain-related fear has been shown to be a better predictor of disability than negative affectivity (Crombez et al., 1999) this does not imply that this individual difference variable is clinically unimportant. On the contrary, as suggested above, negative affectivity may help to explain the elevated reports of social anxiety and avoidance in patients with chronic pain. Thus, since negative affectivity is associated with pain-related fear (Crombez et al., 1999) it is reasonable to contend that it will also have some bearing on the levels of social distress, social avoidance, and fear of negative evaluation that may develop in an individual with chronic pain. Further supporting this contention is the finding that depression magnifies the negative effects of pain on social and occupational functioning, and as such aggravates the outcome of the chronic pain disorder (Verma & Gallagher, 2000).

Consequently, the tendency to experience negative, distressing emotions (i.e., to be high in negative affectivity) may explain why some chronic pain patients experience considerable psychological distress and anxiety in the face of their pain while others do not. Likewise, this general negativity of affect may itself be exacerbated by the experience of pain, and in turn, will function to amplify perceptions of threat from a multitude of stimuli.

Conclusion

The maintenance of pain and chronic pain disorders has most recently been explained in terms of the impact certain illness behaviours have on the experience of pain. Specifically, the way in which people monitor their bodies, define and interpret their symptoms, become fearful and avoidant of the pain, come to view themselves as sick and disabled, and use lay and professional sources of help is thought to account for much of the variability in the experience of pain. Illness behaviour is, therefore, a process by which individuals struggle to achieve some accommodation or mastery over their current situation.

Although previous research has predominantly focused on illness behaviours and cognitions directly relating to the pain experience, such as pain-related fear and avoidance (e.g., Crombez et al., 1999; Vlaeyen et al., 1995a,b; Waddell et al., 1993), the findings of the present study suggest that the psychological distress and avoidance typically exhibited by a patient with chronic pain is not pain-specific. On the contrary, these patients report more distress and avoidance of social situations, in addition to a higher fear of negative evaluation, than community-based respondents with some or no pain.

While the present study appears to raise as many questions as it has attempted to answer, regarding the source of social anxiety and avoidance in chronic pain patients, it has nonetheless provided some valuable and enlightening information as to the nature and extent of the social fear in chronic pain patients relative to community-based controls. The contribution of these social fears to the

maintenance of chronic pain and related disability is pending. Further investigation regarding the origin of social anxiety and avoidance in chronic pain patients is warranted, since it is unclear whether these fears predate the initial injury or pathology or whether in fact they are a reflection of the pervasive psychological distress that typically accompanies chronic pain.

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Appendices

Appendix 1.

A Study on the Effects of Social Anxiety on Chronic Pain

Information Sheet[i]

You are invited to participate in a study looking at the effects of social anxiety – that is, worries and concerns about certain social situations – on the experience of chronic pain. The purpose of the study is to investigate whether certain worries and stressors, which may seem unrelated to pain, influence the experience of pain. Renée Seebeck, a Postgraduate student at Massey University, is conducting this study in partial fulfilment of a Master's thesis.

Principal Investigator:	Renée Seebeck, Masterate Student	Supervisor :	Malcolm Johnson, Senior Lecturer
Address:	School of Psychology, Massey University, Private Bag 11 222, Palmerston North	Address:	School of Psychology, Massey University, Private Bag 11 222, Palmerston North
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Email:	Renee.F.Seebeck@xtra.co.nz	Email:	M.Johnson@massey.ac.nz

This sheet provides an overview of the study so that you may make an informed decision about whether or not you would like to participate. You are under no obligation to participate in this project.

About the Study

- The study looks at the effects of social anxiety on the experience of chronic pain.
- The study involves answering a series of questions about your response to pain, your feelings about social situations and being around others, and the degree to which you might avoid some situations.
- It is important to note that there are no right or wrong answers. We are just interested in trying to understand how certain worries and concerns may affect your pain.

[i] The information sheets handed out at the different pain clinics differed only in terms of the specific contact name and telephone number given for further information about the study. The information sheet given to the community-based sample differed slightly in terms of the explanation offered in the 'selection of participants' section and gave only the researcher's name and contact details for further information about the study.

- If you decide to participate, you are welcome to take the questionnaire home to complete it, and then return it at your earliest convenience (either to clinic staff, or by pre-paid envelope to Renée Seebeck at the above address). The questionnaire should take no longer than 30 minutes to complete.

- **Consent to Participate:** If you return a completed questionnaire, it will be assumed that you have understood the present information sheet for volunteers taking part in the study designed to investigate the effects of social anxiety on chronic pain, and consequently, have consented to participate.

Selection of Participants

We are interested in the differences between those suffering from chronic pain and healthy individuals, both in terms of experiencing pain and social concerns. You were selected for this study because you have a chronic pain problem. Thus, we are recruiting people who attend several of the pain services in New Zealand. In addition, we are recruiting people from local businesses in and around Palmerston North who will help to make up a comparison group.

Benefits, Risks and Safety

While there are no direct benefits for your participation in this study, we hope that it will give us a greater insight into the ways in which non-pain fears, such as social anxiety, impact upon the experience of chronic pain. Increased understanding of the way in which social anxiety affects pain provides health professionals with ideas for further interventions and pain management in this area.

Participation

- Participation in this study is entirely voluntary (your choice). If you choose not to take part, this will *not* affect your future care or treatment.

- If you agree to take part, *you are free to withdraw from the study at any time*, without having to give a reason and this will in no way affect your future health care or treatment.

Confidentiality and Anonymity

It is important to note that your responses to this questionnaire will remain confidential to the research and will not be shown to anyone that is not involved in the project. Your name and address is only required should you request a summary of the results on completion of the study. Names and addresses will be kept entirely separate from the questionnaires in order that all responses remain anonymous. No material that could personally identify you will be used in any reports on this study.

Further information about the study

If you would like further information about the study, or have any questions or concerns, please do not hesitate to contact the researcher, Renée Seebeck, at the above address or **local clinic staff** at Dunedin Hospital Pain Clinic, phone Jeni Blezard on: (03) 474 0999 xt.8185.

If you have any queries or concerns regarding your rights as a participant in this research you may contact a Health and Disability Advocacy Service, phone (03) 479 0265 (or 0800 112 233).

Statement of Approval

This study has received ethical approval from the Massey Human Ethics Committee and the Otago Ethics Committee on behalf of the Dunedin Hospital Pain Clinic.

✂ ----------

Summary of the Results

If you would like a summary of the results of this study on completion, please complete your name and postal or Email address below. As it takes some time to analyse the results of studies, it may be almost a year after you complete this questionnaire before you receive the summary. Please note that your name and address will be detached from your questionnaire responses on receipt. This will ensure the anonymity of your responses.

Participants Name: _____

Postal Address: _____

_____

_____Email Address:_____

Study on Social Anxiety and Chronic Pain

Confidential Questionnaire

Anxiety may play an important role in exacerbating or increasing pain. It is hoped, through this questionnaire, that a clearer understanding of how social concerns and worries may influence the experience of pain, will be gained.

For the success of this study, please take into account the following while answering the questionnaire:

- There are no right or wrong answers to these questions, so we ask you to be as honest as possible when completing the questionnaire.
- To ensure the usefulness of this research, it is important that you try and answer all of the questions (Please note that the questionnaire is double-sided).
- Your immediate reaction or response to the question is what is wanted here, there is no need to think too long on each question.

Consent to Participate: Please note that if you return a completed questionnaire, it will be assumed that you have understood the information sheet for volunteers taking part in the study investigating the effects of social anxiety on chronic pain, and consequently, have consented to participate.

If you have any further questions or queries about this study or questionnaire, please do not hesitate to contact Renée Seebeck through the School of Psychology, Massey University, Private Bag 11 222, Palmerston North, telephone: (06) 350 5799 ext.2040, or Email: Renee.F.Seebeck@xtra.co.nz

Thank you for your time ☺

Appendix 2.

The Pain Anxiety Symptoms Scale[ii]

➘ Individuals who experience pain develop different ways to respond to that pain. We would like to know what you do and what you think about when in pain. Please use the rating scale below to indicate how often you engage in each of the following thoughts or activities. Circle any number from 0 (**Never**) to 5 (**Always**) for each item.

	NEVER					ALWAYS
1. I think that if my pain gets too severe, it will never decrease.	0	1	2	3	4	5
2. My mind is calm when I am in pain.	0	1	2	3	4	5
3. When I feel pain, I try to stay as still as possible.	0	1	2	3	4	5
4. I become sweaty when in pain.	0	1	2	3	4	5
5. When I feel pain, I am afraid that something terrible will happen.	0	1	2	3	4	5
6. My thoughts are agitated and keyed up as pain approaches.	0	1	2	3	4	5
7. I go immediately to bed when I feel severe pain.	0	1	2	3	4	5
8. Even though it hurts, I know I am going to be O.K.	0	1	2	3	4	5
9. My body gets shaky when I hurt.	0	1	2	3	4	5
10. I feel disoriented and confused when I hurt.	0	1	2	3	4	5
11. When pain gets severe, I call my doctor or go to the emergency room.	0	1	2	3	4	5
12. I begin trembling when engaged in an activity that increases pain.	0	1	2	3	4	5
13. When I feel pain, I become afraid of dying.	0	1	2	3	4	5
14. I can't think straight when in pain.	0	1	2	3	4	5
15. I will stop any activity as soon as I sense pain coming on.	0	1	2	3	4	5
16. Even if I do an activity that causes pain, I know it will decrease later.	0	1	2	3	4	5
17. Pain seems to cause my heart to pound or race.	0	1	2	3	4	5
18. I think I have a serious medical problem that my physician has failed to uncover.	0	1	2	3	4	5
19. As soon as pain comes on, I take medication to reduce it.	0	1	2	3	4	5
20. I have pressure or tightness in my chest when in pain.	0	1	2	3	4	5

[ii] McCracken, Zayfert, and Gross (1992, 1993).

	NEVER					ALWAYS
21. When I feel pain I think that I might be seriously ill.	0	1	2	3	4	5
22. During painful episodes it is difficult for me to think of anything besides the pain.	0	1	2	3	4	5
23. I avoid important activities when I hurt.	0	1	2	3	4	5
24. When I sense pain, I feel dizzy or faint.	0	1	2	3	4	5
25. Pain sensations are terrifying.	0	1	2	3	4	5
26. When I hurt, I think about the pain constantly.	0	1	2	3	4	5
27. I take medication if I know I need to do something that usually increases the pain.	0	1	2	3	4	5
28. I have trouble catching my breath when I have pain sensations.	0	1	2	3	4	5
29. I dread feeling pain.	0	1	2	3	4	5
30. I am bothered by unwanted thoughts when I'm in pain.	0	1	2	3	4	5
31. If a chance comes to do something I enjoy, I do it even if it causes pain.	0	1	2	3	4	5
32. Pain makes me nauseous.	0	1	2	3	4	5
33. When pain comes on strong, I think that I might become paralysed or more disabled.	0	1	2	3	4	5
34. I find it hard to concentrate when I hurt.	0	1	2	3	4	5
35. I seek reassurance that I am O.K. during times of more severe pain.	0	1	2	3	4	5
36. I find it difficult to calm my body down after periods of pain.	0	1	2	3	4	5
37. I worry when I am in pain.	0	1	2	3	4	5
38. My stomach bothers me when I experience pain.	0	1	2	3	4	5
39. I try to avoid activities that cause pain.	0	1	2	3	4	5
40. I can think pretty clearly even while experiencing severe pain.	0	1	2	3	4	5

PASS subscales: Fearful appraisals = 1 + 5 + 8 + 13 + 16 + 18 + 21 + 25 + 29 + 33; Cognitive anxiety = 2 + 6 + 10 + 14 + 22 + 26 + 30 + 34 + 37 + 40; Physiological anxiety = 4 + 9 + 12 + 17 + 20 + 24 + 28 + 32 + 36 + 38; Escape/Avoidance = 3 + 7 + 11 + 15 + 19 + 23 + 27 + 31 + 35 + 39.

Appendix 3.

Fear Questionnaire[iii]

➘ Choose a number from the scale below to show how much you would avoid each of the situations listed below because of fear or other unpleasant feelings. Then write the number you chose in the box opposite each situation.

0	1	2	3	4	5	6	7	8
Would not avoid it		*Slightly avoid it*		*Often avoid it*		*Mostly avoid it*		*Always avoid it*

1. Injections or minor surgery..... ☐
2. Eating or drinking with other people..... ☐
3. Hospitals..... ☐
4. Travelling alone by bus or coach..... ☐
5. Walking alone in busy streets..... ☐
6. Being watched or stared at..... ☐
7. Going into crowded shops..... ☐
8. Talking to people in authority..... ☐
9. Sight of blood..... ☐
10. Being criticised..... ☐
11. Going alone far from home..... ☐
12. Thought of illness or injury..... ☐
13. Speaking or acting to an audience..... ☐
14. Large open spaces..... ☐
15. Going to the dentist..... ☐

FQ subscales: Social phobia = 2 + 6 + 8 + 10 +13; Blood/injury phobia = 1 + 3 + 9 + 12 + 15; Agoraphobia = 4 + 5 + 7 + 11 + 14

[iii] Marks and Matthews (1979)

Appendix 4.

Social Avoidance and Distress scale[iv]

➘ We are interested in how people feel about social situations. Please use the rating scale below to indicate how much you **agree** or **disagree** with the following statements, by ticking the appropriate box.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I feel relaxed even in unfamiliar social situations.	❒	❒	❒	❒	❒
2. I try to avoid situations which force me to be very sociable.	❒	❒	❒	❒	❒
3. It is easy for me to relax when I am with strangers.	❒	❒	❒	❒	❒
4. I have no particular desire to avoid people.	❒	❒	❒	❒	❒
5. I often find social occasions upsetting.	❒	❒	❒	❒	❒
6. I usually feel calm and comfortable at social occasions.	❒	❒	❒	❒	❒
7. I am usually at ease when talking to someone of the opposite sex.	❒	❒	❒	❒	❒
8. I try to avoid talking to people unless I know them well.	❒	❒	❒	❒	❒
9. If the chance comes to meet new people, I often take it.	❒	❒	❒	❒	❒
10. I often feel nervous or tense in casual get-togethers in which both sexes are present.	❒	❒	❒	❒	❒
11. I am usually nervous with people unless I know them well.	❒	❒	❒	❒	❒
12. I usually feel relaxed when I am with a group of people.	❒	❒	❒	❒	❒
13. I often want to get away from people.	❒	❒	❒	❒	❒
14. I usually feel uncomfortable in a group of people I don't know.	❒	❒	❒	❒	❒
15. I usually feel relaxed when I meet someone for the first time.	❒	❒	❒	❒	❒
16. Being introduced to people makes me tense and nervous.	❒	❒	❒	❒	❒

[iv] Watson and Friend (1969).

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
17. Even though a room is full of strangers, I may enter it anyway.	❒	❒	❒	❒	❒
18. I would avoid walking up and joining a large group of people.	❒	❒	❒	❒	❒
19. When my superiors want to talk with me, I talk willingly.	❒	❒	❒	❒	❒
20. I often feel on edge when I am with a group of people.	❒	❒	❒	❒	❒
21. I tend to withdraw from people.	❒	❒	❒	❒	❒
22. I don't mind talking to people at parties or social gatherings.	❒	❒	❒	❒	❒
23. I am seldom at ease in a large group of people.	❒	❒	❒	❒	❒
24. I often think up excuses in order to avoid social engagements.	❒	❒	❒	❒	❒
25. I sometimes take the responsibility for introducing people to each other.	❒	❒	❒	❒	❒
26. I try to avoid formal social occasions.	❒	❒	❒	❒	❒
27. I usually go to whatever social engagements I have.	❒	❒	❒	❒	❒
28. I find it easy to relax with other people.	❒	❒	❒	❒	❒

SAD Subscales: Social distress = 1 + 3 + 5 + 6 + 7 + 10 + 11 + 12 + 14 + 15 + 16 + 20 + 23 + 28; Social avoidance = 2 + 4 + 8 + 9 + 13 + 17 + 18 + 19 + 21 + 22 + 24 + 25 + 26 + 27.

Appendix 5.

The Fear of Negative Evaluation scale[v]

➘ We are interested in how people feel about social situations and being around others. Please use the rating scale below to indicate how much you **agree** or **disagree** with the following statements, by ticking the appropriate box.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I rarely worry about seeming foolish to others.	❒	❒	❒	❒	❒
2. I worry about what people will think of me even when I know it doesn't make any difference.	❒	❒	❒	❒	❒
3. I become tense and jittery if I know someone is sizing me up.	❒	❒	❒	❒	❒
4. I am unconcerned even if I know people are forming an unfavourable impression of me.	❒	❒	❒	❒	❒
5. I feel very upset when I commit some social error.	❒	❒	❒	❒	❒
6. The opinions that important people have of me cause me little concern.	❒	❒	❒	❒	❒
7. I am often afraid that I may look ridiculous or make a fool of myself.	❒	❒	❒	❒	❒
8. I react very little when other people disapprove of me.	❒	❒	❒	❒	❒
9. I am frequently afraid of other people noticing my shortcomings.	❒	❒	❒	❒	❒
10. The disapproval of others would have little effect on me.	❒	❒	❒	❒	❒
11. If someone is evaluating me I tend to expect the worst.	❒	❒	❒	❒	❒
12. I rarely worry about what kind of an impression I am making on someone.	❒	❒	❒	❒	❒
13. I am afraid that others may not approve of me.	❒	❒	❒	❒	❒
14. I am afraid that people will find fault with me.	❒	❒	❒	❒	❒
15. Other people's opinions of me do not bother me.	❒	❒	❒	❒	❒
16. I am not necessarily upset if I do not please someone.	❒	❒	❒	❒	❒

[v] Watson and Friend (1969).

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
17. When I am talking to someone, I worry about what they may be thinking about me.	❒	❒	❒	❒	❒
18. I feel that you can't help making social errors sometimes, so why worry about it.	❒	❒	❒	❒	❒
19. I am usually worried about what kind of impression I make.	❒	❒	❒	❒	❒
20. I worry a lot about what my superiors think of me.	❒	❒	❒	❒	❒
21. If I know someone is judging me, it has little effect on me.	❒	❒	❒	❒	❒
22. I worry that others will think that I am not worthwhile.	❒	❒	❒	❒	❒
23. I worry very little about what others may think of me.	❒	❒	❒	❒	❒
24. Sometimes I think I am too concerned with what other people think of me.	❒	❒	❒	❒	❒
25. I often worry that I will say or do the wrong things.	❒	❒	❒	❒	❒
26. I am often indifferent to the opinions others have of me.	❒	❒	❒	❒	❒
27. I am usually confident that others will have a favourable impression of me.	❒	❒	❒	❒	❒
28. I often worry that people who are important to me won't think very much of me.	❒	❒	❒	❒	❒
29. I brood about the opinions my friends have about me.	❒	❒	❒	❒	❒
30. I become tense and jittery if I know I am being judged by my superiors.	❒	❒	❒	❒	❒

Appendix 6.

Anxiety Sensitivity Index[vi]

↘ Individuals respond to feelings of anxiety in different ways. Please indicate the degree to which you **agree** or **disagree** with the statements below, by ticking the appropriate box.

	Very Little		Neutral		Very Much
1. It is important to me not to appear nervous.	❒	❒	❒	❒	❒
2. When I cannot keep my mind on a task, I worry that I might be going crazy.	❒	❒	❒	❒	❒
3. It scares me when I feel "shaky" (trembling).	❒	❒	❒	❒	❒
4. It scares me when I feel faint.	❒	❒	❒	❒	❒
5. It is important to me to stay in control of my emotions.	❒	❒	❒	❒	❒
6. It scares me when my heart beats rapidly.	❒	❒	❒	❒	❒
7. It embarrasses me when my stomach growls.	❒	❒	❒	❒	❒
8. It scares me when I am nauseous.	❒	❒	❒	❒	❒
9. When I notice that my heart is beating rapidly, I worry I might have a heart attack.	❒	❒	❒	❒	❒
10. It scares me when I become short of breath.	❒	❒	❒	❒	❒
11. When my stomach is upset, I worry that I might be seriously ill.	❒	❒	❒	❒	❒
12. It scares me when I am unable to keep my mind on a task.	❒	❒	❒	❒	❒
13. Other people notice when I feel shaky.	❒	❒	❒	❒	❒
14. Unusual body sensations scare me.	❒	❒	❒	❒	❒
15. When I am nervous, I worry that I might be mentally ill.	❒	❒	❒	❒	❒
16. It scares me when I am nervous.	❒	❒	❒	❒	❒

ASI subscales: Fear of somatic sensations = 4 + 6 + 7 + 8 + 9 + 10 + 11 + 14; Fear of cognitive and emotional dyscontrol = 1 + 2 + 3 + 5 + 12 + 13 + 15 + 16 (Asmundson, Frombach, & Hadjistavropoulos, 1998).

[vi] Peterson and Reiss (1992).

Appendix 7.

Pain Severity

➘ Choose a number from the rating scale below to indicate your *current* pain intensity, your *average* pain intensity over the last month, the *least* or slightest amount of pain over the last month, and your *worst* or most intense pain experienced over the last month - from 0 (**no pain**) to 10 (**intense as you can imagine**). Please circle the appropriate number on the rating scales below.

1. **Current** pain intensity

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

2. **Average** pain intensity over the last month

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

3. **Least pain** over the last month

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

4. **Worst pain** over the last month

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

Appendix 8.

Type of pain

- If any, what type of pain do you suffer from? (please tick one box)

Occupational overuse or RSI ❑

Fibromyalgia ❑

Chronic low back pain ❑

Whiplash or neck pain ❑

Reflex sympathetic dystrophy or complex regional pain syndrome ❑

Phantom limb pain ❑

Neuropathic pain ❑

Headache ❑

Little or no specific pain ❑

A chronic condition/illness *unrelated* to pain ❑

Other (please specify)

Appendix 9.

Appendix 9. Simple correlations between the self-report measures provided by the community-based group reporting little or no specific pain.

Measure	FA^{PASS}	CA^{PASS}	PA^{PASS}	EA^{PASS}	FNE	SD^{SAD}	SA^{SAD}	SP^{FQ}	BI^{FQ}	AG^{FQ}	SS^{ASI}	CE^{ASI}	SEV	DUR
FA^{PASS}	-													
CA^{PASS}	.77**	-												
PA^{PASS}	.68**	.78**	-											
EA^{PASS}	.56**	.64**	.51**	-										
FNE	.33*	.29*	.27*	.27*	-									
SD^{SAD}	.21	.25	.28*	.06	.38*	-								
SA^{SAD}	.24	.14	.31*	.04	.43**	.64**	-							
SP^{FQ}	.42**	.39*	.35*	.22	.61**	.47**	.42**	-						
BI^{FQ}	.42**	.43**	.19	.26*	.18	.08	.14	.38*	-					
AG^{FQ}	.44**	.47**	.38*	.43**	.39*	.33*	.22	.58**	.55**	-				
SS^{ASI}	.59**	.46**	.44**	.50**	.51**	.09	.21	.26	.24	.27*	-			
CE^{ASI}	.54**	.41**	.38*	.44**	.54**	.16	.34*	.34*	.22	.26*	.69**	-		
SEV	.13	.19	.26	.16	.06	.17	.02	.08	-.17	-.05	.06	.17	-	
DUR	.11	.13	.24	.19	.00	.19	.23	-.07	.07	.14	.10	.11	.26	-

Note: FA^{PASS} = PASS fearful appraisals; CA^{PASS} = PASS cognitive anxiety; PA^{PASS} = PASS physiological anxiety; EA^{PASS} = PASS escape/avoidance behaviour; FNE = Fear of Negative Evaluation; SD^{SAD} = SAD social distress; SA^{SAD} = SAD social avoidance; SP^{FQ} = FQ social phobia; BI^{FQ} = FQ blood/injury phobia; AG^{FQ} = FQ agoraphobia; SS^{ASI} = ASI fear of somatic sensations; CE^{ASI} = ASI fear of cognitive and emotional dyscontrol; SEV = Average pain severity rating; DUR = Duration of pain; ^{PASS} = subscale of the Pain Anxiety Symptoms Scale; ^{SAD} = subscale of the Social Avoidance and Distress scale; ^{FQ} = subscale of the Fear Questionnaire; ^{ASI} = subscale of the Anxiety Sensitivity Index.

$^{*}p < 0.05$; $^{**}p < 0.01$. All p values two-tailed.

Appendix 10.

Appendix 10. Comparisons of simple and partial correlations (controlling for pain severity) between measures of social anxiety/avoidance and pain-related cognitive/affective variables provided by the community-based group reporting little or no pain.

	Little or no pain group					
	FNE		Social distress[SAD]		Social avoidance[SAD]	
Measure	Simple *r*	Partial *r*	Simple *r*	Partial *r*	Simple *r*	Partial *r*
Fearful appraisals[PASS]	.33*	.33*	.21	.19	.24	.23
Cognitive anxiety[PASS]	.29**	.29*	.24**	.22	.14	.13
Physiological anxiety[PASS]	.27*	.26*	.28*	.25	.31*	.31*
Escape/avoidance[PASS]	.27*	.27*	.02	-.00	.06	.05
Fear of somatic sensations[ASI]	.51**	.51**	.10	.08	.22	.22
Fear of cognitive and emotional dyscontrol[ASI]	.54**	.54**	.16	.14	.34**	.34**

Note: FNE = Fear of Negative Evaluations scale; [PASS] = subscale of the Pain Anxiety Symptoms Scale; [SAD] = subscale of the Social Avoidance and Distress scale; [ASI] = subscale of the Anxiety Sensitivity Index.

*p <0.05; **p < 0.01. All p values two-tailed.

Appendix 11.

Appendix 11. Comparisons of simple and partial correlations (controlling for anxiety sensitivity) between measures of social anxiety/avoidance and pain-related cognitive/affective variables provided by the community-based group reporting little or no pain.

	Little or no pain group					
	FNE		Social distress^{SAD}		Social avoidance^{SAD}	
Measure	Simple *r*	Partial *r*	Simple *r*	Partial *r*	Simple *r*	Partial *r*
Fearful appraisals^{PASS}	.33*	-.02	.21	.17	.24	.08
Cognitive anxiety^{PASS}	.29**	.04	.24**	.22	.14	.00
Physiological anxiety^{PASS}	.27*	.03	.28*	-.26	.31*	.22
Escape/avoidance^{PASS}	.27*	-.02	.02	-.05	.06	-.10

Note: FNE = Fear of Negative Evaluations scale; ^{PASS} = subscale of the Pain Anxiety Symptoms Scale; ^{SAD} = subscale of the Social Avoidance and Distress scale.

*p <0.05; **p < 0.01. All p values two-tailed.