AN EXPLORATION OF ATTRIBUTIONS, JUST WORLD BELIEFS AND ADJUSTMENT IN ADULT PAIN SUFFERERS

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Abstract

The present study examined the nature of and relationship between attributions, just world beliefs (JWB) and adjustment in a sample of 62 community pain sufferers. This was exploratory because it accounted for shortcomings of these concepts, meaning they have not been investigated like this in pain. Specifically, it accounted for the scarcity of research distinguishing between cause, responsibility and blame; allowing the self-definition of responsibility, blame and adjustment; examining changes in attributions and adjustment, and considering just world beliefs. The importance of investigating these issues in pain was detailed.

The research was conducted in two phases. The first, brief phase piloted a measure to account for these shortcomings. The second phase used the piloted measure to investigate the shortcomings in a series of five aims.

Descriptive analyses indicated that most participants made causal attributions for their pain, with around half attributing responsibility and blame. Although similar in the types of attributions made, cause was distinguished from responsibility and blame, which were indistinguishable from each other. Attributions did not change. Additionally, JWB were weakly correlated with pain intensity, and analyses of variance techniques found JWB to interact with pain duration, such that those with 1 month-2.5 years' duration had stronger JWB than those in the 3-9 years' duration.

JWB did not interact with attributions or adjustment, but chi-square analyses found attributions interacted with adjustment, such that attributions to the self were adaptive, while attributions to others resulted in poor adjustment to pain. Stepwise multiple regression analyses suggested that these latter attributions predicted pain intensity, as did pain treatments. Additionally, individual differences in attributions, adjustment and pain intensity emerged in chi-square analyses, although none were found on JWB.

Full interpretations were made of these findings, and their implications for future research discussed.

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Finally, I would like to say a big thank you to all of the pain sufferers who participated in this research. I sincerely hope it will help alleviate your suffering in some way.

Declaration

I hereby declare that this thesis has been composed by myself and that the work is my own. No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification at this or any other university or institute of learning.

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CHAPTER 1: INTRODUCTION AND THESIS OVERVIEW

Pain presents a challenge on several levels. It is a challenge to health professionals and clinicians who attempt to treat it. It is a challenge to scientists who strive to understand the biological mechanisms behind pain. It is also a challenge to society, which strives to find the medical, scientific and financial resources to prevent or at least relieve pain as much as possible (Melzack and Wall, 1996). However, the biggest challenge of pain must be to the people who suffer from it. Theirs is sometimes a lifelong struggle to live with pain that cannot be treated. This struggle occurs on several levels. The effects of pain are immediately physiological, with economic, social and psychological consequences. This thesis will consider the consequences of pain, paying particular attention to the psychological impact, in relation to what people come to believe about their pain, in terms of attributions about pain, just world beliefs in relation to pain, their interactions both with each other, and with adjustment to pain.

The research undertaken in the thesis is presented in six chapters. Chapter 2 provides an overview of literature investigating beliefs and adjustment in pain. There are three main sections to the chapter. The first section provides an overview of the nature of pain. The second section discusses the foundations and theoretical origins of attributions, just world beliefs and adjustment, and the third section reviews the nature of the relationship between attributions and adjustment in pain and related illness and injured samples.

Chapter 3 outlines and provides a justification for the research aims of the study. Chapter 4 details the method employed in the study, including design issues, the study instruments, and how the data was managed. Chapter 5 provides a detailed analysis of the aims of the study outlined in Chapter 3. The sixth chapter overviews the study rationale, interprets and discusses the main findings of the study in relation to the literature reviewed in Chapter 2, assesses the contribution of the results to the literature, and reflects on the study limitations and implications of the study findings, both clinical and for future research.

CHAPTER 2: LITERATURE REVIEW: BELIEFS AND ADJUSTMENT IN PAIN

2.1 THE NATURE OF PAIN

2.1.1 Introduction

The first section of the chapter will review relevant literature on the nature of pain. The following areas will be considered. Firstly, pain definitions and types of pain. Secondly, the progression of pain from the acute to the chronic state. Thirdly, the prevalence of pain in the community. Fourthly, physiological and psychological theories of pain. Fifthly, the measurement of the physiological experience of pain, and sixthly, the impact of pain on individuals suffering from it. This first section of the chapter will close with a summary of all sections.

2.1.2 Defining Pain

Given its complexity, the concept "pain" has never been satisfactorily defined (Melzack and Wall, 1996). The most commonly used definition states, "Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage" (International Association for the Study of Pain (IASP), 1979). However, despite the all-inclusive nature of this definition, there remain a number of criticisms. For example, it has been noted that the use of the word "unpleasant" is unsatisfactory, because the experience of pain is much more than this. What is missing from the definition is the misery, anguish, desperation and urgency that are part of some pain experiences (Melzack and Wall, 1996). Additionally, it has been suggested that the IASP definition has become largely meaningless by attempting to incorporate all facets of pain. "Such a flexible and indistinct definition is no definition at all" (Horn and Munafo, 1997, p.50). Instead, it is suggested that the definition adopted by researchers should be based on the perspective they are working from (Horn and Munafo, 1997). However, despite these criticisms the IASP definition has been widely used and has the advantage of accounting for the emotional as well as sensory components of the pain experience (Melzack and Wall, 1996). As such, this definition of pain was adopted in this study.

Several different types of pain have been identified. These can generally be classed as acute and chronic. Acute pain is essentially a sensory experience which serves an important adaptive function in that it warns an individual that something is wrong (Sternbach, 1984). This then prompts action to be taken to resolve the problem and promote survival. Chronic pain, on the other hand, serves no adaptive function in that it persists beyond the time in which healing would be expected to occur. Various pain duration criteria have been used to determine when pain becomes chronic. This has varied from two weeks (Crook, Rideout and Browne, 1984; Crook, Tunks, Rideout and Browne, 1986), to six months (Jones, 1993; Zarkowska and Philips, 1986), and even five years after the initial pain onset (Ackerman and Stevens, 1989). However, the most commonly used criterion for chronic pain is that defined by the IASP (1986), which states that chronic pain is, "pain that persists beyond normal tissue healing time, which is taken to be three months". This criterion was adopted in the present study.

2.1.3 The Process Involved in Becoming a Chronic Pain Sufferer

The acute pain response is something health professionals are best prepared to handle, where it is assumed that once the injury is treated and healing has taken place, pain will cease (Hanson and Gerber, 1990). This is not the case with chronic pain. Violon (1982) developed a model of the process involved in becoming a chronic pain sufferer which suggests that at the onset of pain, an individual presents him/herself to a doctor, who aims to find a clear-cut cause of the pain. This could involve using conservative treatments and, where they fail, surgical treatment, with the idea that "pain equals disease" (p.26). This treatment might last for a number of years after the initial pain onset. If treatment fails to resolve the pain, a doctor may view his/her patient as having nothing physically wrong and make a referral for psychological assessment to determine any possible psychological roots of the pain. A pain sufferer who feels there is a physiological basis to his/her pain could resent such a referral. This may lead to a search for another doctor who will be able to name and resolve the pain. Although at this stage it is evident that the pain is unlikely to be resolved, some pain sufferers and health professionals still view the pain as if it were acute by continually searching for causes and cures of it (Hanson and Gerber, 1990; Horn and Munafo, 1997). This is likely to focus the pain sufferer on his/her condition permanently, leading to the belief that there is something seriously wrong.

Given that chronic pain is something that may not be resolved, and is such a problem for both those who are suffering from it, and those who attempt to treat it, consideration will now be given to its prevalence in the community.

2.1.4 The Prevalence of Pain

Crook et al (1984) provided an example of the incidence of acute pain in the community, where they found 5% of a randomly selected sample of Canadian households to report experiencing acute pain in the two weeks preceding their survey. Estimates of the prevalence of chronic pain in the community have been difficult to determine due to two main problems. Firstly, some prevalence rates have been based on pain clinic samples (Crook et al, 1986; Crook, Tunks, Kalaher and Roberts, 1988; Crook, Weir and Tunks, 1989). However, pain experienced in these samples differs from that experienced in the general community, and so generalisations cannot be made from one sample to the other (Crombie and Davies, 1998). Secondly, prevalence rates are difficult to collate, due to the many different types of pain on which these rates are based, different countries of study, and different research methods used to obtain them.

To date, five studies have investigated the prevalence of chronic pain in the United Kingdom. Using different methods, three of these have reported rates of 7% (Bowsher, Rigge and Sopp, 1991), 35% (Croft, Rigby, Boswell, Schollum and Silman, 1993), and 20.7% (Gureje, Von Korff, Simon and Gater, 1998). Additionally, Elliot, Smith, Penny, Smith and Chambers (1999) found 50.4% of a sample of the general population selected from general practices in the Grampian area of Scotland to report chronic pain. These reports were based on the experience of general chronic pain. In contrast, Smith, Elliot, Chambers, Smith, Hannaford and Penny (2001) reported both on the significance and severity of chronic pain in the community, and found prevalence rates of 14.1% for pain significance and 6.3% for pain severity. This suggests that although up to 50% of any community sample can report experiencing chronic pain, the percentage of those who experience it to a significant or severe degree is actually quite small.

2.1.5 Pain Theories

2.1.5.1 Introduction

Three main physiological pain theories include specificity theory, pattern theory, and Gate Control Theory. These will be considered before psychological theories of pain are addressed.

2.1.5.2 Specificity Theories

The main idea of specificity theory is that the brain receives information about pain from free nerve endings (Muller, 1842). This holds that there is a direct, one-way communication from the pain receptors in the skin to the brain, specifically the thalamus that was postulated to be the "pain centre" (Head, 1920). Two main criticisms have been made of this theory. Firstly, that it is naïve to assume stimulation of free nerve endings will lead to a sensation of pain, because stimulating free nerve endings may awaken other senses (Melzack and Wall, 1996). Secondly, there may not be a direct link between stimulation of pain receptors and the amount of pain experienced. Physiological evidence suggests that gentle touch can trigger excruciating pain, and pain can spread to various parts of the body, other than that stimulated. This fails to suggest a rigid, straight-through system from pain receptors in the skin to the brain (Melzack and Wall, 1996). Additionally, psychological factors can influence the extent to which pain is experienced, depending on, for example, how the pain is interpreted (Melzack and Wall, 1996). Despite criticism, this was a useful theory of acute pain, providing the basis for subsequent research.

2.1.5.3 Pattern Theories

In order to account for the weaknesses of specificity theory, other pain theories were developed and grouped under "pattern theory". Pattern theories propose that all nerve endings are alike. The simplest form, peripheral pattern theory (Sinclair, 1955; Weddell, 1955), holds that pain is due to excessive peripheral stimulation of non-specific receptors, which is interpreted centrally as pain. However, this has been criticised on the basis that it does not take account of receptor-fibre specialisation (Melzack and Wall, 1996). Livingston (1943) developed one other form of pattern theory that can be used to explain the experience of prolonged pain, such as phantom limb pain. This model asserts that stimulation of sensory nerve fibres initiates activity in reverberatory circuits in the grey matter of the spinal cord. These circuits are closed, self-exciting loops of neurons, and when stimulated are self-sustaining and can lead to pain being experienced long after an injury has healed. This abnormal activity can generate volleys of nerve impulses that are interpreted centrally as pain, and can be triggered by stimuli that are not normally painful.

Although both specificity and pattern theories make a contribution to understanding acute and chronic pain mechanisms, they do not provide a satisfactory general theory of pain. They lack unity, and fail to address the complex experience of pain (Melzack and Wall, 1996).

2.1.5.4 Gate Control Theory

The Gate Control Theory of pain (Melzack and Wall, 1965) accounted for the limitations of earlier pain theories, through accounting for the complex experience of pain. This involves not only the physiological experience of pain, but also psychological mechanisms such as past experience, expectation and emotion, which can affect individual perceptions and interpretations of the physiological pain experience (Skevington, 1995).

The main proposition of the theory is that there is a neural "gate" in the dorsal horns of the spinal cord that can be opened or closed in varying degrees, thereby modulating incoming pain signals before they reach the brain. Pain is perceived when the amount of information that passes through the gate exceeds a critical level. The route from the periphery to the brain proceeds through a series of stages. At first, peripheral nerve fibres, myelinated A-delta and unmyelinated C-fibres are stimulated by injury. They then deliver impulses to the centrally projecting transmission cells in the dorsal horns of the spinal cord, which contain facilitatory cells. A third type of fibre, large diameter A-beta fibres are thought to have an inhibitory function. Close to the transmission cells in the spinal cord is the substantia gelatinosa, which contains both excitatory and inhibitory neurons. The A-beta fibres are thought to activate cells in the substantia gelatinosa, which serve to inhibit the activity of the transmission cells. A-delta and C-fibres inhibit the activity of the substantia gelatinosa and facilitate the transmission cells. The balance of activity from these cells will determine if the "gate" is opened or closed.

Pain information going through the gate reaches centres in the brain responsible for the physiological and emotional aspects of the pain experience. Once pain information has reached the brain, several factors such as emotion, attention and past experience can influence how the pain is perceived. These factors can also serve to open or close the "gate" in descending inhibitory controls from the brain, and can alter sensory messages travelling from the spinal cord to the brain. This suggests a loop from the spinal cord to the brain and back to the spinal cord.

The processes involved in Gate Control Theory have been supported by subsequent work (see Melzack and Wall, 1996 for a review of this literature). However, some of this evidence has never been substantiated, and is not consistent with a gating mechanism (Iggo, 1972). Various criticisms of Gate Control Theory have been proposed (see Skevington, 1995 for a review of this literature). Despite this, it was the first theory to introduce pain as a physiological experience at both peripheral and central nervous system levels, which can be influenced by many factors such as past experience and emotional states. As such, it remains the most influential working model for pain researchers.

2.1.5.5 Psychological Theories

Subsequent research has attempted to determine the nature of the relationship between the physiological and psychological experience of pain. Some conflicting ideas have emerged concerning whether psychological dysfunction predates or follows the physiological experience of pain. Some literature has suggested that psychological dysfunction and chronic pain have reciprocal influences over each other (Craig, 1999). Romano and Turner (1985) noted that around 50% of those suffering from pain and depression develop these disorders simultaneously. However, other literature has either suggested emotional disturbance to be a consequence of chronic pain (Gamsa, 1990; Gaskin, Greene, Robinson and Geisser, 1992), or a cause of it (Gamsa and Vikis-Freibergs, 1991). In support of this latter idea, early theoretical propositions suggested that in the absence of any detectable organic cause, the experience of pain must have a psychological basis. Engel (1959) used the term "psychogenic pain" to describe this type of pain. He stated that pain may serve a variety of emotional functions, and because of this certain individuals may actively seek pain, even to the extent of creating it as a psychic experience in the absence of any peripheral stimulus. Similar to Engel, Blumer and Heilbronn (1982) described pain in psychological terms by proposing the experience of pain to be a form of "masked depression".

Pain has been attributed to many types of psychological factors, such as childhood deprivation or trauma, personality problems, suppressed psychic conflict, repressed hostility, aggression, guilt and resentment (Gamsa, 1994; Merskey and Boyd, 1978; Violon, 1982). However, despite this evidence for the psychological basis of pain, the exact nature of the relationship between psychological dysfunction and chronic pain cannot be determined, due to the wide methodological variations adopted in existing research (see Romano and Turner, 1985).

2.1.6 Pain Measurement

2.1.6.1 Introduction

In order to understand and treat pain, it needs to be measured. The measurement of pain is complex; there are many factors that contribute to an individual's response to a question about pain intensity. These include psychological, social and economic factors, as well as personal history, interpretation of symptoms and physical pathology (Jensen and Karoly, 1992). Additionally, the fact that the experience of pain is so subjective is a major problem in its measurement. Given the complexity and subjectivity of the pain experience, it can only ever be studied indirectly (Jensen and Karoly, 1992). Pain intensity has been investigated using unidimensional and multidimensional measures.

2.1.6.2 Unidimensional Measures

The most commonly used unidimensional measures are verbal rating scales, numerical rating scales, and visual analogue scales. Verbal rating scales consist of a series of verbal pain descriptors ordered from the least intense to the most intense (for example no pain, mild, moderate, severe) (Jensen and Karoly, 2001). Each person reads the list and chooses the word which best describes his/her pain intensity at the moment. A score of zero is assigned to the descriptor with the lowest rank, and scores ascend to the score with the highest rank (Melzack and Katz, 1999). Numerical rating scales typically consist of a series of numbers ranging from 0 to 10, or 0 to 100, with endpoints representing the extremes of the possible pain experience, and labelled "no pain" and "worst pain possible", respectively. Each participant chooses the number that best corresponds to the intensity of his/her pain at that moment. The most common visual analogue scale consists of a 10-centimetre horizontal or vertical line with two endpoints labelled, "no pain", and "worst pain ever". A person is required to place a mark on the line at the point that corresponds to his/her perceived pain intensity. The distance in centimetres from the low end of the scale to the patient's mark is used as a numerical index of pain severity (Melzack and Katz, 1999).

There are several advantages and disadvantages of using each of these scales (see Melzack and Katz, 2001 for a review of this literature). One common disadvantage is the assumption that pain is a unidimensional experience which can be measured using a single-item scale (Melzack, 1975). This assumption is based on unidimensional theories of pain, namely specificity and pattern theories.

2.1.6.3 Multidimensional Measures

Gate Control Theory introduced the experience of pain to be multidimensional. As such, a single measure is needed to encompass all aspects of the experience. The McGill Pain Questionnaire (MPQ) (Melzack, 1975) is one of the most widely used measures of the multidimensional pain experience. This scale has its origins in research conducted by Melzack and Torgerson (1971). Physicians and university undergraduates classified 102 words from clinical literature into small groups that described different aspects of the pain experience. From this data the words were split into three major classes and 16 subclasses. The three classes of words reflected the sensory, affective and evaluative aspects of the pain experience. The 16 subclasses were split into the three major classes, and contained words which were considered by most subjects to be qualitatively similar. In addition, each of the word groups in a subclass referred to a specific aspect of the pain experience. For example, the words "flickering", "quivering", "pulsing", "throbbing", "beating" and "pounding" represented the temporal quality of pain in the sensory subclass. Intensity ratings were then attached to each of the words in the 16 subclasses, and a high level of agreement was found on the intensity attached to each word among physicians, patients and students. This formed the basis of the descriptor subclasses of the MPQ.

In completing the MPQ, each descriptor list is read to a participant who selects one word from each list that best describes his/her current pain. The word groups in each subclass are scored, such that the word implying the least amount of pain is assigned a value of one, the next a value of two, and so on in ascending order of intensity. The rank values of the words chosen can be summed to obtain total scores for each of the subclasses, or a total score for all subclasses could be obtained.

There are several advantages and disadvantages to using the MPQ (see Melzack and Katz, 2001 for a review of this literature). One disadvantage is that it takes between 5-10 minutes to complete (Melzack, 1987). A shorter version of the scale, the short-form McGill Pain Questionnaire (SF-MPQ) was developed, which can be completed within 2-5 minutes (Melzack, 1987). The SF-MPQ contains 15 representative words from the sensory (n = 11), and affective (n = 4) classes of the standard MPQ. The 15 pain descriptors were based on the frequency with which they were used by patients suffering from a variety of acute, intermittent and chronic pains. One other sensory word was included in the scale, "splitting", because it is reported to be a key word for dental pain. Items 1-11 comprise the following sensory words: throbbing, shooting, stabbing, sharp, cramping, gnawing, hot-burning, aching, heavy, tender and splitting. Items 12-15 comprise the following affective words: tiring/exhausting, sickening, fearful and cruel-punishing. Each descriptor is ranked on an intensity scale of 0 = "none", 1 = "mild", 2 = "moderate", 3 = "severe".

In addition to the descriptors, the SF-MPQ contains two other measures, a visual analogue scale, and a number-word combination used to describe the overall pain intensity. The visual analogue scale is scored in the way outlined in section 2.1.6.2. The number-word combination consists of a list of five words used to describe pain intensity. The words range in intensity from the lowest (0), to the highest (5), where 0 = no pain, 1 = mild, 2 = discomforting, 3 = distressing, 4 = horrible, and 5 = excruciating. Participants are required to tick the option corresponding to their pain. The SF-MPQ is scored by adding together the rank values of the sensory and affective words chosen (Melzack, 1975), and summing these scores to obtain an overall pain score. A separate overall pain intensity and pain word score is obtained.

There are some advantages to using the SF-MPQ. Firstly, it has demonstrated both concurrent and discriminant validity. Its concurrent validity has been demonstrated from the fact that scores on the SF-MPQ have been found to correlate with scores on the standard MPQ (Dudgeon, Raubertas and Rosenthal, 1993). The discriminant validity of the SF-MPQ is demonstrated from the fact that it has been used in a variety of acute (e.g. Melzack, 1987), and chronic pain conditions (e.g. Church and Vincent, 1996; Dudgeon et al, 1993). Additionally, it has been used to evaluate pain and discomfort in response to medical interventions (see Melzack and Katz, 2001 for a fuller discussion of this). This suggests the SF-MPQ may be capable of discriminating among different pain syndromes. Secondly, it has been found to be usable in a variety of different age groups. Gagliese and Melzack (1997) found consistency in the most frequently chosen pain descriptors across young, middle-aged and older pain sufferers.

The foregoing unidimensional and multidimensional pain measures can be used to assess pain in both acute and chronic pain sufferers. However, by its nature chronic pain is tied up with many complex factors, and so the MPQ would be most appropriately used in this sample. The complexity and longevity of the chronic pain experience will have an impact on a sufferer's life on several levels.

2.1.7 The Impact of Pain

The experience of persistent pain may have a physical, social, economic and psychological impact on an individual. The impact need not follow a set pattern. As pain continues, responses to the pain experience become increasingly individual, thus the impact is likely to vary for different chronic pain sufferers (Zarkowska and Philips, 1986). Additionally, the same painful process can affect people in different ways. Some people may shrug off the symptoms, resulting in the pain having a minimal impact on their lives, while others may be left incapacitated, leading to the pain having a huge impact on their lives (Jones, 1993). This is because pain can affect general mobility (Office of Population Censuses (OPCS), 1993), and in this way restrict daily (Bowsher et al, 1991), and leisure functioning (OPCS, 1993).

Those chronic pain sufferers who have to reduce or give up daily and/or leisure activities may experience social isolation. Smith and Friedemann (1999) found most of their 30 chronic pain sufferers reported feeling isolated and lonely with their pain. They felt separated from and left out of family activities, and they often pushed themselves too hard in order to be included in or meet family responsibilities. The need to meet family responsibilities reflects the need to maintain the family role, one of many different social roles an individual may occupy. This role serves two important functions, as homemaker and nurturer, both of which may be affected by the experience of pain (Reisine, Goodenow and Grady, 1987).

The occupational role may also be threatened by the experience of pain (Tunks and Roy, 1982). Chronic pain may make it difficult or impossible for an individual to continue with his/her occupational role, and if he/she had been the main provider in the household, this role is likely to be lost. A change in household roles may then occur, with someone else adopting the role as provider and the chronic pain sufferer becoming a dependent (Tunks and Roy, 1982), and adopting a sick-role (Sternbach, 1984). One possible outcome of this is pain becoming the central focus of life, with most of the pain sufferers' time being taken up visiting health professionals (Miller and Kraus, 1990). Not all chronic pain sufferers view the sick-role in a negative way. For some there may be a positive side to it as well, where there are "secondary gains" in being exempt from daily responsibilities and receiving attention from others (Gallagher and Wrobel, 1982). Regardless of how the chronic pain sufferer views his/her pain, it will likely have an economic impact on the individual.

Various factors may determine the economic impact of pain on an individual, including the length of work loss, insurance in the event of sickness, alternative sources of income, and entitlement to various benefits (Main and Burton, 2000). For example, disability benefits are usually less than a person earns (Sternbach, 1984), as are any wages which are compensated for in the event of injury (Miller and Kraus, 1990). Additionally, many chronic pain sufferers incur extra treatment costs through the use of alternative therapies and over-the-counter medications that are not reimbursed. They may also incur extra travel costs, where a taxi may be taken to a treatment centre because public transport is inconvenient.

The physical, social and economic impacts of pain are likely to have a psychological impact on a chronic pain sufferer. Many psychological problems may be experienced. Pain may make an individual fearful that something is seriously wrong, believing that pain is a warning of some ongoing pathological process (Sternbach, 1984). In addition, the longer the pain lasts, the less certain the pain sufferer may be that it will resolve (White, Lefort, Amsel and Jeans, 1997). This could lead to feelings of hopelessness, helplessness, despair (Miller and Kraus, 1990), and less life satisfaction (Gamsa, 1990). As indicated in section 2.1.5.5 on psychological theories of pain, pain and emotional distress are strongly associated with each other. Several studies have indicated that the longer pain lasts, the more anxiety, depression and distress is experienced (Ackerman and Stevens, 1989; Hinkley and Jaremko, 1994; Swanson, Maruta and Wolff, 1986; White et al, 1997).

A combination of these affective, cognitive and behavioural dimensions in chronic pain has been described as a "chronic pain syndrome" (Horn and Munafo, 1997; Melzack and Wall, 1996). This suggests that chronic pain sufferers display common behaviour patterns. In support of this idea, certain patterns of abnormal illness behaviour have been identified in these pain sufferers (Pilowsky, Chapman and Bonica, 1977). Pain behaviours may be shaped by positive reinforcement, such as being rewarded through receiving attention from others or analgesic medication each time the behaviour is displayed. In this way pain behaviour becomes a learned response, and reinforcement serves to maintain it. Fordyce (1976) developed an operant approach to behavioural intervention aimed to modify those aspects of a pain sufferers' environment that maintains the pain behaviour. This involves not reinforcing it by for example ignoring signs of "suffering", and reinforcing more appropriate coping behaviour. In this way illness behaviour may be reduced or eliminated. The treatment however is limited in its effectiveness because some individuals do not complete it.

Beyond this, attempts have been made to alter the cognitive component of pain in cognitive-behavioural treatment (Turk, Meichenbaum and Genest, 1983). This holds that cognitive processes such as thoughts, expectancies, beliefs and memories are important because they can lead to problematic changes in both feelings, such as depression, and behaviours, such as an over-dependence on family members or friends, both of which can contribute to pain-related disability. Additionally, compliance with treatment can be affected by what a pain sufferer believes about his/her situation. Whether these beliefs are true or false, adaptive or maladaptive, they determine whether or not an individual will actively comply with treatment. Thus, treatment success ultimately begins with the establishment of beliefs compatible with treatment (DeGood and Shutty, 1992). Cognitive-behavioural treatment is the most effective psychological treatment to date.

2.1.8 Summary

In summary, this section of the chapter reviewed relevant literature on the nature of pain. Two general types of pain were identified: acute and chronic. Theories of pain were also considered. Early physiological pain theories were limited in that they failed to take account of the complexity of the pain experience, instead proposing a direct, one-way pain communication from pain receptors in the skin to the brain. Gate Control Theory addressed this complexity by considering psychological factors that may influence how the physiological experience of pain is interpreted. Psychological theories of pain were also discussed. These theories conflicted about the nature of the relationship between the physiological and psychological experience of pain. Some theories suggested that psychological dysfunction and chronic pain have reciprocal influences over each other, whilst others suggested emotional disturbance is either a consequence of chronic pain, or a cause of it.

The physiological and psychological components of pain have been measured using a multidimensional descriptor tool devised for this purpose, the McGill Pain Questionnaire. Other, unidimensional rating scale measures have also been used to investigate the physiological experience of pain. However, given the subjective nature of the pain experience, each pain measure contains many limitations.

This section of the chapter also considered the impact persistent pain might have on a sufferer's life on four levels: physically, socially, economically and psychologically. A combination of these factors has been identified as a specific pattern of behaviour in chronic pain sufferers, the "chronic pain syndrome". This behaviour pattern can be treated using behavioural means. Additionally, cognitive treatment can be used to alter beliefs that may interfere with compliance with treatment.

2.2 ATTRIBUTIONS, JUST WORLD BELIEFS AND ADJUSTMENT: FOUNDATIONS AND THEORETICAL ORIGINS

2.2.1 Introduction

Since pain beliefs may have repercussions for the pain experience (see section 2.1.7), the second section of the chapter will consider these beliefs in more detail. This will provide the foundation for an investigation of more specific types of beliefs, namely attributions about pain. Attributions will be followed by a review of the influence negative situations such as pain may have over the extent to which an individual believes the world to be a fair and just place. Attributions and just world beliefs will be considered because in addition to pain beliefs, they may also have repercussions for the pain experience, in terms of their interactions with adjustment to pain. As such, this section will end with an overview of the concept of adjustment, followed by a summary of the whole section.

2.2.2 General Pain Beliefs

Lazarus and Folkman's (1984) Cognitive Appraisal Theory has been the most widely used theory investigating the effects of beliefs in adapting to chronic pain. This theory was developed to investigate the relationship between stressful events and adjustment. Within the theory stress is defined as, "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus and Folkman, 1984, p.19). This highlights the interaction between an individual and his/her environment. The extent to which stress is experienced in a situation is dependent upon two appraisal processes. Within primary appraisal, a decision is made concerning whether or not there is stress in an encounter, and the extent of it. Potential stressors may be appraised as either irrelevant, benign-positive, or harmful/threatening/challenging. In secondary appraisal the individual evaluates what may be done in order to combat a threat and the event is re-appraised in the light of this (Lazarus and Folkman, 1984).

In relation to stress, beliefs have been defined as pre-existing ideas of reality through which people view the world. They influence how an environment is appraised through determining how an individual understands it (Lazarus and Folkman, 1984). This will help to determine whether a situation is initially viewed as stressful or not. Stress has been found to be associated with chronic pain in a number of ways. For example, chronic pain and its impact on such things as loss of income have been viewed as significant life-stressors (Jensen, Turner, Romano and Karoly, 1991).

Beliefs about pain have been defined as, "the cognition's (thoughts) patients have about their pain problem" (Jensen et al, 1991, p.250). Beliefs about the onset and treatment of pain in particular and illness in general originate from many sources including scientific explanation, the media and lay referral systems. Scientific explanations include doctor's beliefs about pain/illness. Elder (1973) found half of the osteoarthritis sufferers in her study had learned to call the condition this from their doctors. The other half reported they had learned to call their condition osteoarthritis either from the media (Blaxter, 1983), or people around them. These latter beliefs reflect lay referral systems that may develop from culture or folk theories about pain/illness. Examples of folk theories concerning the treatment of ailments include "old wives tales", such as "a copper bracelet for rheumatism", "a bee sting for arthritis", and "where God puts a disease He also puts a cure" (Skevington, 1995, p.98).

These beliefs may be abandoned when they are refuted by what a person experiences. For example, the cultural belief that pain is a sign that something is wrong and will go away when all is well may be abandoned by the experience of persistent pain (Williams, Robinson and Geisser, 1994). In such a case new pain beliefs will be formulated that are consistent with the individual's pain experience.

The beliefs of persistent pain sufferers have been widely investigated. DeGood and Tait (2001) reported three main categories of pain belief. Firstly, there are beliefs concerned with basic philosophical assumptions about the self and the world. These include beliefs about issues such as justice, fairness, suffering and responsibility. If one believes that life should be free of pain, this may exacerbate the suffering associated with chronic pain. Such beliefs are often inconsistent and unstable. The second category of beliefs are generalised and stable enough to be considered personality traits, such as attributional style (Abramson, Seligman and Teasdale, 1978). This is a particular style adopted to explain events over time. The third type of belief is specific to the experience of pain, tied to what an individual thinks should be done to diagnose and control his/her pain.

Jensen et al (1991) reviewed beliefs specific to individual pain situations, and grouped them into seven categories. These included beliefs about general locus of control; control over pain; attributional style; cognitive errors; self-efficacy; outcome expectancies, and a general category of pain beliefs that did not fit into any of the above categories (see Jensen et al, 1991 for a discussion of these beliefs). Some beliefs covered in this latter category are investigated in pain belief measures. These include the Survey of Patient Attitudes (Jensen, Karoly and Huger, 1987) measuring beliefs associated with pain control, solicitude, medical cure, disability, medication and emotions; the Pain and Impairment Relationships Scale (Riley, Ahern and Follick, 1988), measuring one's ability to function despite pain; the Pain Cognitions Questionnaire (Boston, Pearce and Richardson, 1990), measuring levels of coping, hopelessness/helplessness, and passive optimism; and the Beliefs About Pain Control Questionnaire (Skevington, 1990), measuring beliefs about internal, external and chance control over pain.

Other pain belief measures include the Pain Beliefs and Perceptions Inventory (PBPI) (Williams and Thorn, 1989). This measures perceptions of pain as mysterious, beliefs about the duration of pain, and self-blame for pain. Additionally, the Pain Beliefs Questionnaire (PBQ) (Edwards, Pearce, Turner-Stokes and Jones, 1992) measures beliefs about the cause and treatment of pain. The self-blame measure of the PBPI and the cause measure of the PBQ have both been discussed as a more specific type of belief, attributions.

2.2.3 Attributions

2.2.3.1 Introduction

The following areas of attributions for pain will be considered. Firstly, definitions and theoretical origins. Secondly, conceptual and empirical distinctions between attributions. Thirdly, reasons for making attributions, in terms of their measurement and motives for making them. Fourthly, the extent to which attributions are made. Fifthly, the nature of any attributions made, and sixthly, the changing nature of attributions. Following this review, limitations of attribution research will be identified.

2.2.3.2 Definitions and Theoretical Origins

Three main types of attribution have been identified: cause, responsibility and blame. A cause has been defined as, "that which brings about a change" (Buss, 1978, p.1311). Responsibility has been defined as, "answerable, accountable to another for something, liable to be called to account", or "morally accountable for one's actions" (Fincham and Jaspars, 1980, p.95). These definitions were adopted in the current study. No definition of blame has been found in the literature, and so a dictionary definition was adopted in the present study. This defined blame as, "To find fault with" (Collins Gem English Dictionary, 1985). Cause and responsibility have been discussed within attribution theory, defined as a theory concerned with how ordinary people explain questions beginning with "Why?" (Kelley, 1972; 1973). This often involves the way in which people use their behaviour to explain events in their lives, such as succeeding or failing at some task. There are several types of attribution theory. The most influential is Heider's (1958) Naïve Theory of Psychology.

Diagram 2.1 summarises Heider's (1958) theoretical perspective on making causal attributions. The diagram indicates there are two main types of causal attributions: personal, within the self, and impersonal, in the environment. Each has it own factors which influence whether or not each type of attribution will be made. The presence of the ability and intention to do something at the time of a negative event will influence whether or not personal attributions are made, while the presence of factors such as task difficulty, opportunity and luck will determine whether attributions for some event are made to environmental factors. Heider also suggested different numbers of attributions can be made, i.e. multiple or minimum. Various factors may influence whether a lot or few causes are sought to explain an event. These include emotions experienced at the time of searching for causes to explain an event. Some research suggests that experiencing positive emotions at the time of a negative event will lead to multiple causes being searched for, while negative emotions will lead to few causes being searched for (Liu, Karasawa and Weiner, 1992).

Heider (1958) also developed five responsibility levels that could be assigned for the occurrence of a negative event. Diagram 2.2 summarises these levels. This shows that responsibility assignment ranges in intensity. The lowest intensity, association, is where an individual would be held weakly responsible for an event with which he/she was not causally linked. Justifiable responsibility, the highest intensity, is where an individual would be held fully responsible for an event, but would be justified in carrying out the behaviour that led to a particular effect.

Various criticisms have been made of these levels, including that Heider did not take account of the context in which behaviour occurs, thereby failing to consider the circumstances which led to the behaviour (Fishbein and Ajzen, 1973). Despite this, experimental literature has supported the existence of the responsibility levels (Shaw and Sulzer, 1964). These levels have also been reinterpreted as legal responsibility rules (Hamilton, 1978), paralleling responsibility levels in the legal literature (Hart, 1968). This provides a real-life application of the levels, although beyond experimental and legal literature little use has been made of them.

Blame attributions have been discussed within Janoff-Bulman's (1979) Theory of Self-Blame. Two main types of self-blame have been identified. Behavioural self-blame involves blaming one's behaviour for a negative event. Characterological self-blame involves blaming one's character for a negative event. Both types of self-blame and their individual features are summarised in Diagram 2.3. One of the features is that behavioural self-blame is adaptive in that it allows an individual to adjust well to his/her situation. However, characterological self-blame is maladaptive, resulting in poor adjustment to a negative situation. Explanations for this are given in Diagram 2.3. Although behavioural self-blame is adaptive, not all situations lend themselves to the making of these attributions because behaviours may not be regarded as justifiable causes of serious events. For example a disease victim who has always taken care of his/her health cannot make behavioural self-blame attributions for contracting the disease (Janoff-Bulman and Thomas, 1989).

Janoff-Bulman's (1979) distinctions have been criticised by Shaver and Drown (1986). They suggested that neither type of blame reflects true blame. Instead, behavioural self-blame is a self-attribution of causality, and characterological self-blame is a self-attribution of responsibility, because it lacks the intention required for blame. However, Macleod (1999) stated that although they may not measure blame, Janoff-Bulman's (1979) predictions remain unaltered. This is because Shaver and Drown (1986) indicated that causal attributions should be related to the re-establishment of perceived control over future outcomes (reflecting behavioural self-blame), while responsibility attributions should threaten self-esteem and increase the likelihood of future distress (reflecting characterological self-blame).

Behavioural and characterological self-blame have been examined in real-life situation of rape (Janoff-Bulman, 1979), and situations related to pain, specifically involving cancer (Malcarne, Compas, Epping-Jordan and Howell, 1995; Timko and Janoff-Bulman, 1985), burns (Kiecolt-Glaser and Williams, 1987), and spinal injuries (Sholomskas, Steil and Plummer, 1990). In these studies both types of blame were measured using a Likert scale to indicate the extent of each type attributed.

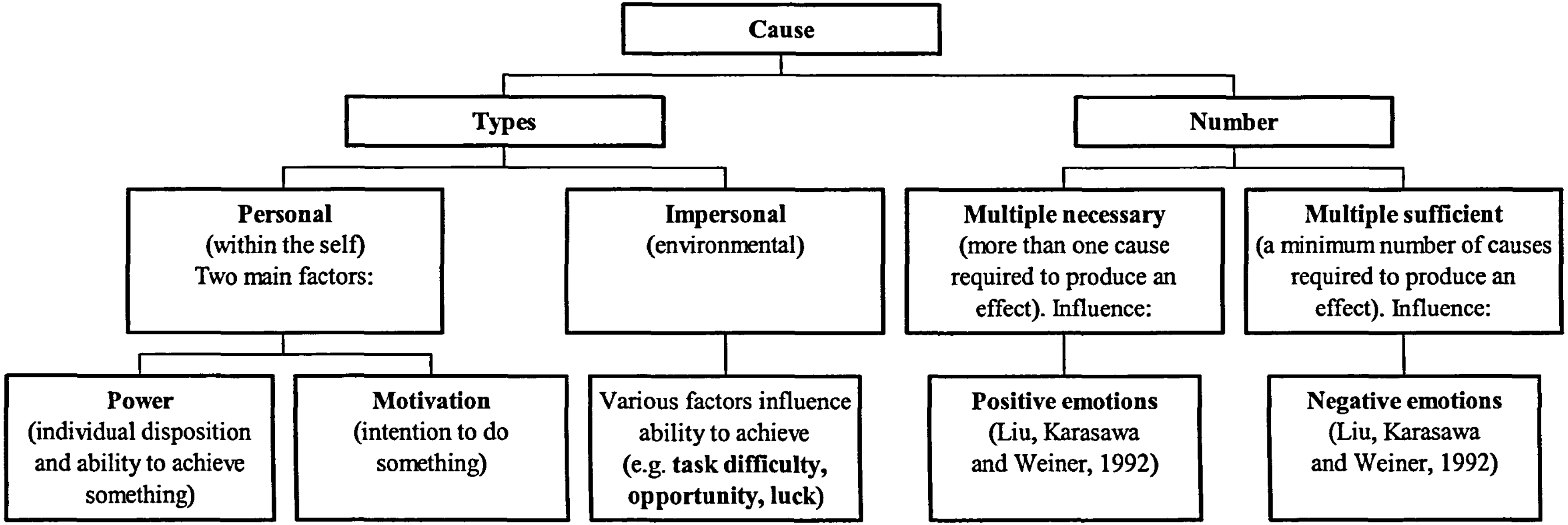


Diagram 2.1: Heider's (1958) theoretical perspective on making causal attributions

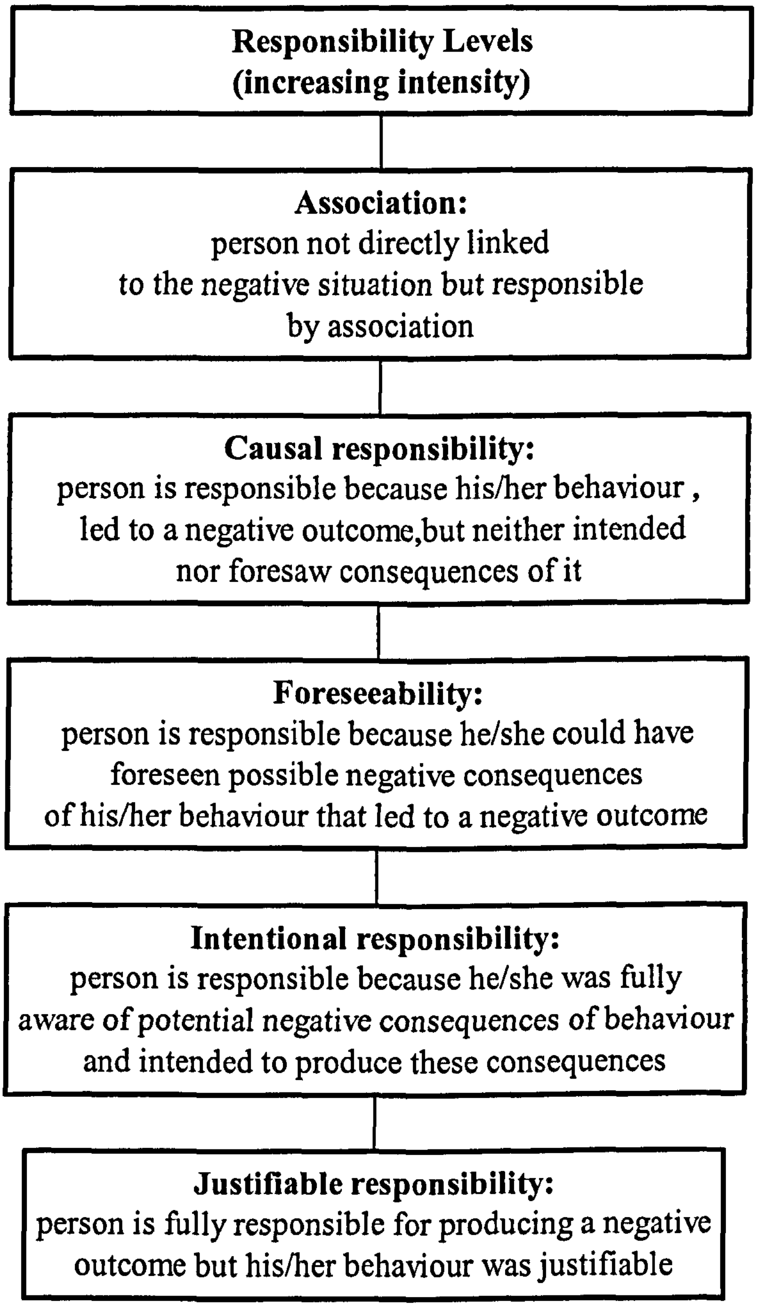


Diagram 2.2: Heider's (1958) five responsibility levels

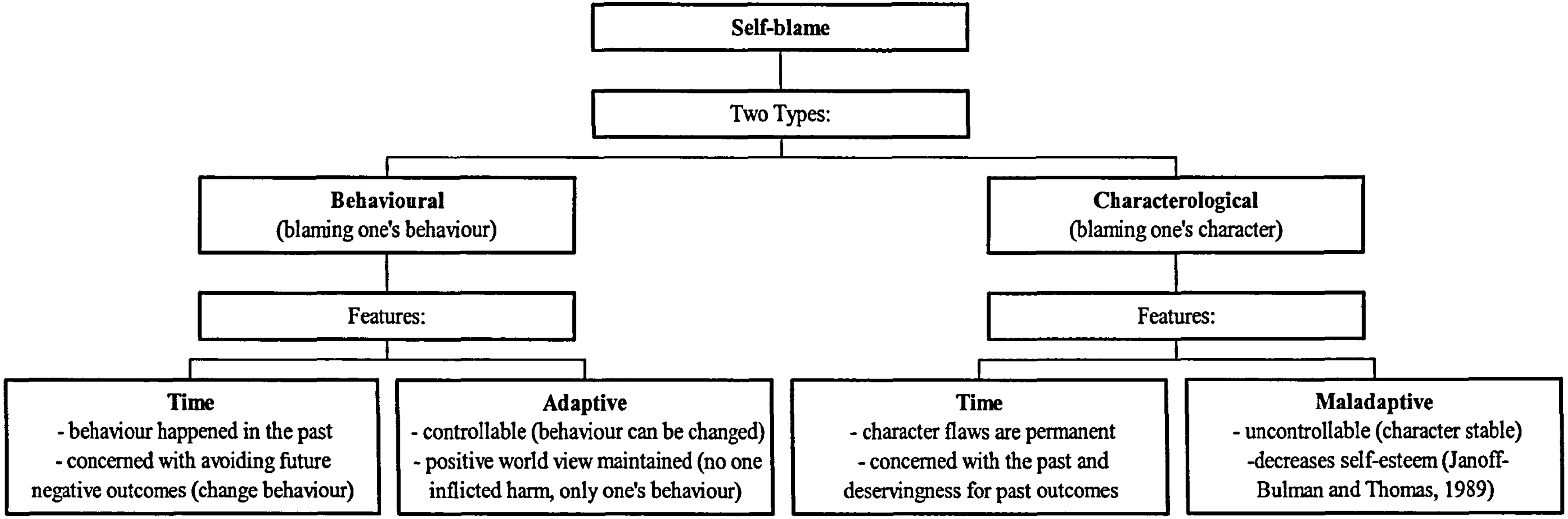


Diagram 2.3: Janoff-Bulman's (1979) Theory of Self-Blame

2.2.3.3 Conceptual Distinctions Between Cause, Responsibility and Blame

Before embarking on conceptual distinctions between cause, responsibility and blame, it is relevant to note that causal attributions have been theoretically distinguished from one other type of attribution, reason attributions. In the same way that Buss (1978; 1979) defined a cause as, "that which brings about a change", he defined a reason as, "that for which a change is brought about" (Buss, 1978, p. 1311) (such as goals, purposes). In defining both concepts in this way, Buss described causes and reasons as logically distinct categories for explaining different aspects of behaviour. Behaviour which 'occurs' is not intentional and is explained in terms of causes, while behaviour which is 'done' by someone is intentional and is explained in terms of reasons. Thus, the type of attribution which is made depends on the type of behaviour to be explained (occurrences or actions). Although criticisms have been made of this theory (Harvey and Tucker, 1979; Kruglanski, 1979), its distinctions between cause and reason attributions have been made elsewhere (Kruglanski, 1975). Additionally, the theory did highlight the fact that both concepts should not be used interchangeably.

Shaver (1985) developed a Theory of Blame Assignment in which he distinguished between cause, responsibility and blame. The theory proposes that all three are related but conceptually distinct concepts. Shaver (1985) proposed the following criteria for the assignation of blame. Firstly, although causes themselves do not have to be of human origin, and can be human without the intention to create a negative situation, in order for blame to be assigned an individual must have intentionally caused a negative outcome. Secondly, for responsibility to be assigned a person must have caused something, although this does not have to be intentional. Additionally, an individual can be found responsible for something he/she did not cause, for example a parent being held responsible for something his/her child caused. Thirdly, when an individual has been found responsible for something, whether or not blame is assigned depends on certain criteria. Firstly, an individual must have intentionally conducted behaviour, aware that it would lead to negative consequences. Secondly, the actions taken to produce the negative consequences must be voluntary. Thirdly, the individual must have had a normal capacity to understand what he/she was doing (i.e. must be able to distinguish between what is right and wrong). If any of these criteria are not met, blame will not be assigned. However, even in the presence of all criteria, blame may still not be assigned. This is because an individual may have a good justification or excuse for his/her behaviour. It is only in the presence of all criteria, and in the absence of a good justification or excuse that blame might be attributed.

Although the theory suggests cause, responsibility and blame are related, it also indicates differences between them. Specifically, causes can operate independently of responsibility, and both concepts can operate independently of blame, although blame assignment requires that both cause and responsibility attributions are made. The concepts have also been distinguished on two other levels. Firstly, responsibility is equated with moralness, while blame is related to wrongdoing. Secondly, cause and responsibility can be attributed for positive and negative events, while blame can only be assigned for negative events.

Some literature has criticised Shaver's (1985) conceptual distinctions. It has been suggested that while this model of blame assignment was developed as a model of how blame ought to be assigned to an actor by a perceiver, blame is not always assigned in this way for two reasons. Firstly, the perceiver may not be so attentive to the conceptual distinctions. People may blame others through wanton recklessness rather than intentional action (Shaver, 1992). Related to this, investigating cause and blame attributions for spinal injuries, Wortman (1983) found her sample seemed annoyed by what they viewed as highly redundant questions. This suggests they did not distinguish between the concepts. Indeed, it has been suggested that even when distinctions are made between the concepts, people may not distinguish between them (Tennen and Affleck, 1990). Secondly, people may pay attention to the definitions, but assign blame even when they know it is not warranted because to do this serves a psychological purpose for them (Shaver, 1992).

The above points suggest there may be differences between how the lay person uses attribution concepts, and conceptually sophisticated distinctions between them. In support of this, Shaver, Null and Huff (1982) found differences in distinctions made in responsibility-related words between attribution experts and students. Shaver (1985) warned that sophisticated distinctions between the concepts should not be imposed upon ordinary perceivers who are the subject of scientific enquiry. Instead, it has been suggested that even though lay perceivers make conceptual errors in their use of attributions, this is how they use these concepts, and it is the job of researchers to understand how the lay person interprets these explanations (Lalljee, 1981).

Most research interprets attributions in this way. Few studies define attributions to their participants. Only three studies have been found to do this. Borek and Shaver (1988) did this in their sample of young adults whose parents had experienced marital conflict. Although the precise definitions given were not reported, the results indicated that cause, responsibility and blame were highly correlated among those who had not been given definitions of the concepts, to values of between 0.79 and 0.88. This was interpreted as a failure to distinguish between them. However, lower correlations were found between the concepts among those who had received definitions of them, although this was only for correlations between cause and blame ($r = 0.46 - 0.60$), and responsibility and blame ($r = 0.46 - 0.54$). Cause and responsibility remained indistinguishable from each other ($r = 0.76 - 0.82$). This suggests that providing definitions of the concepts may help people distinguish between them. Of the remaining two studies to define the concepts, Berckman and Austin (1993) confused the terms "cause" and "reason", both of which have been distinguished from each other. Additionally, Drown (1985) provided definitions reflecting the way in which attributions were defined in Shaver's (1985) Theory of Blame Assignment.

2.2.3.4 Empirical Distinctions Between Cause, Responsibility and Blame

Empirical distinctions between cause, responsibility and blame have fallen behind conceptual distinctions, because conceptual distinctions are more easily drawn than tested (Shaver, 1985). Empirical distinctions have been based on a wide variety of experimental and real-life research. This point is important to highlight because those who are suffering in real-life research may view the concepts in a different way to those who are viewing the suffering of others in experimental situations (Tennen and Affleck, 1990). Few studies have investigated and distinguished between all three concepts. Critchlow (1985) did this in her experimental study of attributions for drunken behaviour, reporting correlations between the concepts to range from 0.2 - 0.7. Contrary to the way in which Borek and Shaver (1988) interpreted their high attributional correlations (see section 2.2.3.3), these correlations were interpreted as representing the conceptual closeness of the concepts, whilst remaining distinct from each other. Mantler, Schellenberg and Stewart Page (2003) supported this idea in their experimental study of judgements of cause, responsibility and blame in males diagnosed either with cancer, or Acquired Immune Deficiency Syndrome. They found all three concepts were correlated to values of between 0.8 - 0.9, and stated that this reflects the overlapping nature of the concepts, whilst still remaining distinct from each other. Indeed, differences in their magnitude suggested that participants distinguished between them. In particular, cause had a higher magnitude than responsibility, which had a higher magnitude than blame.

More commonly, pairs of attribution concepts have been examined in experimental and real-life research. Within real-life research there is a scarcity of literature measuring the use of more than one of these concepts in pain situations. Instead, attribution pairs have been explored in research investigating the attributions of those suffering from illness and injury, in different ways. In some instances they were used as two separate measures, with their results being reported separately (Gotay, 1985; Koslowsky, Croog and LaVoie, 1978; Moulton, Sweet, Temoshok and Mandel, 1987; Taylor, Litchman and Wood, 1984). In other instances pairs of attribution concepts have been statistically (Brewin, 1984; Rich, Smith and Christensen, 1999), and descriptively distinguished from each other (Pill and Stott, 1982). Some research has failed to distinguish statistically between attributions (Sholomskas et al, 1990; Wortman, 1983). The basis of this was high correlations between pairs of concepts. For example, Sholomskas et al (1990) reported a correlation of 0.55 between responsibility and blame, and interpreted this as such a high correlation that they are the same concept. This contrasts Critchlow's (1985) consideration of the conceptual closeness of the concepts. Responsibility and blame tend to be measured more in illness and injury situations, than pain situations. This being the case, the rest of the literature review will consider attributions made in pain/illness/injury situations.

2.2.3.5 Influences on Whether or Not Attributions are Made

Attributions may be made for the onset of pain/illness/injury either because they are directly measured (Enzle and Shopflocher, 1978), or for motivational reasons. Each will be considered in turn.

Three types of attribution measures have been identified: rating scales (i.e. structured measures), open-ended measures (i.e. unstructured measures), and spontaneous measures (Michela and Wood, 1986; Turnquist, Harvey and Anderson, 1988). Rating scales have the advantage that they allow attributions to be quantified easily, but have the drawback that they are derived by the experimenter and, as such, may result in demand effects (Turnquist et al, 1988). Open-ended measures have the advantage that they allow participants to produce their own attributions, thereby decreasing demand effects. Additionally, participants in studies may find them a more natural way to provide responses, and they are more suitably used in new situations (Elig and Frieze, 1979). However, this type of measure is subject to two criticisms. Firstly, subtle differences in questions may produce different results. For example, the question, "Why?" in some studies may reflect causes of illness more than the question "Why me?" (as opposed to someone else) in other studies, which may suggest an injustice has occurred (Lowery, Jacobsen and DuCette, 1993; Michela and Wood, 1986). A second criticism is that open-ended measures may lead researchers to probe further attribution responses. Turnquist et al (1988) discussed the implications of this using an example of a heart patient reporting a high serum cholesterol level as a cause of his/her illness. Investigators who probe to elicit the response that diet is the cause of high cholesterol may obtain results that are different from those of an investigator who accepts the initial response. Finally, spontaneous attribution measures are the least prone to error, although they may create problems for coding (Turnquist et al, 1988).

Causal attributions have been examined using both structured and unstructured measures. Unstructured measures involve asking participants about any causes they attribute for their condition, as well as asking them to consider the question, "Why me?" in relation to their illness. Although this measure has faced criticism, Lowery, Jacobsen and McCauley (1987) defended its use in causal attribution research by stating that although the question is not appropriately phrased to gather causal attributions, a direct causal attribution question may produce answers which come from health professionals, rather than their own thoughts. Structured causal attribution measures consist of rating scales containing a list of possible causes of a particular illness, with participants being asked to select and/or rate the importance of a list of possible causes in contributing to their illness.

Responsibility and blame attributions are commonly examined using structured measures. These can consist of ratings of the extent to which participants feel various participants are responsible/to blame for their condition. More commonly, however, a measure involving the assignment of responsibility or blame to the self, others, the environment and chance factors is used. This has been criticised by Shaver and Drown (1986), who stated that for blame attributions to be made, the intention to act must be present. Although the self and others are capable of intentional action, the environment and chance are not. This makes the measure inadequate to be used in blame studies.

People may be motivated to make unprompted attributions. Spontaneous causal attributions may be made to explain a negative and unexpected outcome, whether something is known about the cause of it or not (Sensky, 1997; Weiner, 1985; Wong and Weiner, 1981), and when there is uncertainty and threat in a situation (Michela and Wood, 1986). Thus, the onset of pain/illness/injury, which may involve all of these factors, may prompt a causal search in order to understand the onset of the negative situation. However, some pain/illness/injury situations are not of a sudden onset. In situations of a gradual onset, causal attributions might be made in order to gain control over the situation (Rothbaum, Weisz and Snyder, 1982). They do this by giving meaning to bodily discomfort, and suggesting possible actions to take to reduce it (Stoekle and Barsky, 1981).

Motives for spontaneously making responsibility and blame attributions involve weighing up the advantages and disadvantages of making these attributions. Advantages include whether the suffering person is likely to be compensated. Responsibility and blame are more likely to be attributed when there will be compensation. For example, those involved in industrial accidents will be more likely to blame their employer to get compensation than those involved in domestic accidents where the chance of being compensated is remote (Lloyd-Bostock, 1991). One disadvantage involves the social repercussions of making these attributions. Claiming is seen as a nasty thing to do, and taking legal action against a work colleague, friend or family member may have many social costs, as well as being upsetting and bewildering (Lloyd-Bostock, 1991).

One other motive for making spontaneous attributions common across cause, responsibility and blame involves the maintenance of the belief in a just world (Lerner, 1980). This will be considered in section 2.2.4.

2.2.3.6 The Making of Attributions

Few studies have measured spontaneous attributions in pain/illness/injury patients (Abrams and Finesinger, 1953; Bard and Dyk, 1956; Gudmunsdottir, Johnston, Johnston and Foulkes, 2001). This makes it impossible to determine the extent to which attributions are freely made for these situations. In order to gain some idea of this, research using unstructured attribution measures will be examined to determine the extent to which attributions are made when participants are given the opportunity not to do so.

Causal attributions for the onset of pain/illness/injury have been made by between 69 - 95 percent of patients suffering from these conditions (Turnquist et al, 1988), regardless of the nature of the condition. For example people suffering from non life threatening conditions such as rheumatoid arthritis, and life threatening cancer and myocardial infarction conditions tend to make causal attributions to some extent for their condition (Affleck, Pfeiffer, Tennen and Fifield, 1987; Bale, 1996; Berckman and Austin, 1993; Gudmunsdottir et al, 2001; Lavery and Clarke, 1996; Low, Thoresen, Pattillo and Fleishmann, 1993; Lowery, Jacobsen and Murphy, 1983; Lowery, et al 1987; Lowery et al, 1993; Taylor et al, 1984).

Additionally, casual attributions have been made at different times in these illness experience, from around the time of the onset of the condition, to several years later. However, contradictory evidence suggests that causal attributions are largely not made around the time of an illness onset (Fielding, 1987; Mumma and McCorkle, 1982-83; Rudy, 1980). One explanation for this is that at this time there is more concern with treatment issues than causal attributions for the illness. Causal explanations may come later. In support of this, both Mumma and McCorkle (1982-83), and Rudy (1980) found that one month after suffering a myocardial infarction, patients reported not knowing the cause of the attack. However, two months after the attack, most gave a cause for it.

Most participants in the rheumatoid arthritis, cancer and myocardial infarction studies reviewed gave causes for the onset of their conditions regardless of what was medically known about them. The causal attributions given by the myocardial infarction sufferers were likely to have been driven by medical knowledge concerning what causes this. However, little is medically known about what causes rheumatoid arthritis and cancer, yet there was a high incidence of these sufferers proposing their own causes of the conditions. It is these attributions, searched for in the absence of medical knowledge, which are likely to hold meaning to an individual, and as such may have greater implications for adjustment to the negative situation.

The making of causal attributions at the time of an interview has been distinguished from having previously considered attributions for a negative situation. Some studies have asked participants if they had ever previously considered "Why me?" in relation to their pain/illness/injury, and if not to consider it at the time of the interview (Gotay, 1985; Lowery et al 1987; Lowery et al 1993). Around one-quarter (Gotay, 1985) or one-half (Lowery et al, 1987; Lowery et al, 1993) of the participants in these studies reported having previously considered what caused their situation. However, if participants had not previously considered this then any subsequent attributions made may be unlikely to influence adjustment to the negative situation (Gudmunsdottir et al, 2001).

A minority of participants in the arthritis, cancer and myocardial infarction studies reviewed did not make causal attributions. There are two possible explanations for this. Firstly, the participants may have been searching for a solution to the condition as a way of adjusting to it (Rothbaum et al, 1982). The second point is that it may simply have been unimportant for some people to make a causal attribution. The importance of making a causal attribution has been found to vary at different times in the same illness experience (Lowery et al, 1993). Additionally, the rated importance of making attributions has been distinguished from the attributions that are made. Taylor et al (1984) found most of their breast cancer sufferers made causal attributions for the onset of their condition, despite reporting the making of causal attributions to be largely unimportant at this time. Although the attributions were made retrospectively, the results suggest that attributions may be made without any importance being attached to them. Attributions made under these circumstances may have little effect on how an individual adjusts to his/her pain/illness/injury situation.

Rates of the extent to which responsibility and blame are attributed for the onset of pain/illness/injury cannot be determined due to the largely structured nature of these measures (see section 2.2.3.5). The only chance participants have to refrain from making attributions, is in relation to the specific attribution being measured. For example when asked whom, if anyone, they think was responsible or to blame for their situation, participants can respond with "no one". Under these circumstances people refrain from making attributions (DeGood and Kiernan, 1996; Schulz and Decker, 1985).

2.2.3.7 The Nature of Attributions Made

Several factors may influence the nature of the causal attributions made for the onset of pain/illness/injury. These include gender (Elder, 1973), education level (Pill and Stott, 1982), religion (Bulman and Wortman, 1977), and social class (Taylor, 1982). Additionally, the types of causal attributions made have been found to be disease-specific in a variety of samples. These include rheumatoid arthritis (Affleck et al, 1987a; Lowery et al, 1983; Lowery et al, 1987), breast cancer (Bale, 1996; Lavery and Clarke, 1996; Lowery et al, 1993; Taylor et al, 1984), lung cancer (Berckman and Austin, 1993; Faller, Schilling and Lang, 1995; Mumma and McCorkle, 1982-83), and myocardial infarction (Affleck, Tennen and Croog, 1987; Affleck, Tennen, Croog and Levine, 1987; Croog and Richards, 1977; Fielding, 1987; Gudmunsdottir et al, 2001; Koslowsky et al, 1978; Low et al, 1993; Petrie and Weinman, 1997; Rudy, 1980). This has been regardless of whether structured or unstructured causal attribution measures were used to measure them.

Causal attributions for these conditions have been made to various different factors. For example, rheumatoid arthritis has frequently been attributed to fate, personal habits, the environment and heredity. Similarly, breast cancer has frequently been attributed to various factors including stress and diet. There have, however, been inconsistencies in the most frequent cause attributed for these conditions. This can be attributed to the lack of medical knowledge concerning the causes of rheumatoid arthritis and breast cancer, which may have led to people suffering from these conditions developing their own causes. In support of this idea, Kroode, Oosterwijk and Steverink (1989) found people suffering from various forms of cancer gave their own, sometimes uncertain explanations for their cancer, given the lack of medical knowledge into the causes of cancer. There has been more consistency about the most frequent causes of lung cancer and a myocardial infarction, both of which can be explained medically.

Structured responsibility and blame measures typically encourage participants to make attributions for their condition to the self, others, the environment and chance factors. Attributions to chance factors have been found to be the most common response in injured (Bulman and Wortman, 1977; Heineman, Bulka and Smetak, 1988; Kiecolt-Glaser and Williams, 1987; Nielson and MacDonald, 1988), and illness samples (Gotay, 1985). Fewer attributions in these samples were made to the self and other people. Indeed, incidences of these attributions in injured samples have typically ranged from between 20-30%, and there have been some instances of no self-blame attributions being made at all (Schulz and Decker, 1985), yet these are the most commonly investigated responsibility and blame attributions.

There has been conflict about whether two types of self-blame, namely behavioural and characterological self-blame are made in equal amounts (Timko and Janoff-Bulman, 1985), or if behavioural self-blame is made more often than characterological self-blame (Kiecolt-Glaser and Williams, 1987; Malcarne et al, 1995; Sholomskas et al, 1990). Several different types of spontaneous self and other-blame attributions have also been identified. Self-blame attributions include blaming past behaviours for illness, a misdeed, one's own negligence, punishment for wrongdoing, and a failure to preserve one's health (Abrams and Finesinger, 1953; Bard and Dyk, 1956; Moses and Cividali, 1966). Other-blame attributions include blaming for inheritance, a blow by a family member, overexertion in the care of a sick relative, doctor negligence, and emotional tension created by others (Abrams and Finesinger, 1953; Bard and Dyk, 1956; Church and Vincent, 1996; Moses and Cividali, 1966).

The context in which the onset of pain/illness/injury occurs will determine whether or not self or other-blame attributions are made. If no one else was involved in an accident in which an individual was injured, then self-blame attributions for the accident will be more likely to be made (Bulman and Wortman, 1977). If someone else was involved, then blame for the accident is more likely to be attributed to this other person (Bulman and Wortman, 1977). Tennen and Affleck (1990) contributed to this by proposing that when the person present is in a position of authority, when he/she is not well-known, and when the outcome is severe, blame is more likely to be attributed to him/her. They did however, state that another person need not be present in order to be blamed for something. For example, doctors can be blamed for acts of negligence, even when they were not present at the time of the injury onset. Thus, when an authority figure is involved in a negative event, whether present or not, the probability of other-blame increases. Subsequent research has supported this idea (Church and Vincent, 1996; DeGood and Kiernan, 1996). For example, Church and Vincent (1996) investigated the blame attributions of chronic pain sufferers who had been injured as a result of a variety of different medical accidents, and found 86% of them blamed their doctor for their conditions, specifically the consultant or surgeon whose care the patient was under. Similar attributions have been made in other chronic pain samples (Eccleston, Williams and Stainton-Rogers, 1997).

2.2.3.8 Changes in Attributions Over Time

There is a scarcity of literature investigating cause, responsibility and blame attributions longitudinally in chronic pain/illness/injury samples. Skevington (1993) investigated causal attributions for rheumatoid arthritis from its initial onset, up to two years later, and found differences in the attributions made over time. Stable attributions (the belief that the pain would go away) tended to be made more often around the onset of rheumatoid arthritis. Global attributions (that the symptoms of the condition affect every area of the sufferers' lives) tended to be made more often the further the length of time since diagnosis. Given the lack of longitudinal investigations, support for the changing nature of causal attributions in chronically ill samples comes from cross-sectional studies. These have shown that attributions may be made at some time in the illness experience and not others. Lowery et al (1993) found breast cancer sufferers who made a causal attribution for their cancer to be around 11 months past diagnosis of the cancer, while those who did not have a cause were around 17 months past their diagnosis. From this, the authors proposed that the intensity of the situation around the onset of the cancer might have prompted a causal search in order to understand the situation. The need for this may have subsided with the intensity of the situation over time. This suggests that making attributions may vary over time depending on their importance at different stages of a pain/illness/injury situation.

Cross-sectional studies have also indicated that the nature of the attributions may change over time. Lavery and Clarke (1996) found their breast cancer sufferers made controllable attributions (i.e. attributions which allowed them to feel in control of their cancer) around the onset of their cancer. However, the longer the length of time since diagnosis, the more uncontrollable attributions (i.e. attributions which did not allow them to feel in control of their cancer) were made. These results have been replicated elsewhere (Gotay, 1985). However, the latter findings should be interpreted with caution given that the controllability of the attributions in this study were inferred by the researcher, and may be at odds with the cancer sufferers' own interpretations of the controllability of their attributions. Berckman and Austin (1993) found in their sample of lung cancer sufferers that the longer the length of time since diagnosis, the less likely causal attributions were to be made to external factors such as air pollution. To the extent that external factors are seen to be uncontrollable, this finding contradicts those of Lavery and Clarke (1996) and Gotay (1985). However, it has been proposed that external attributions are not necessarily uncontrollable. They may reflect the process of secondary control, where for example they can be reinterpreted in a positive way in order to allow an individual to accept his/her situation, and maintain a form of control over it (Rothbaum et al, 1982). This interpretation supports the idea that causal attributions are likely to be made to uncontrollable factors over time.

These results suggest that causal attributions may change over time in chronically ill samples. However, the causal attributions of acutely ill patients have remained unchanged a couple of months after a myocardial infarction (Mumma and McCorkle, 1982-83; Rudy, 1980), one year later (Affleck et al, 1987b; Croog and Richards, 1977; Gudmunsdottir et al, 2001), and eight years later (Affleck et al, 1987c). There are three explanations for this. Firstly, this lack of change in attributions over time may reflect an attributional style (Affleck et al 1987b). Secondly, it may be that over time making causal attributions becomes less important, leading to the same attributions being given over time (Mumma and McCorkle, 1982-83). Thirdly, the structured nature of some measures may lead people to select the same causal responses over time.

Although the heart attack patients did not change the nature of their attributions, some made fewer attributions over time (Gudmunsdottir et al, 2001). One explanation for this is that with time they became more knowledgeable about the causes of a myocardial infarction, and so formed fewer, more specific attributions over time (Gudmunsdottir et al, 2001).

The available literature on the changing nature of responsibility and blame attributions suggests attributions to the self might change over time, up to one year after the onset of a spinal cord injury. Reidy and Caplan (1994) found 89% of their spinal-injured sample changed their blame attributions, with an increase in self-blame attributions and a decrease in other-blame attributions over an 18-24 month period. Richards, Elliot, Shewchuk and Fine (1997) contradicted this. They found half of their spinal-injured sample who attributed responsibility to themselves for their injury onset no longer made these attributions to themselves a year later. The authors suggested attributions might change because perhaps new information is learned over time about the circumstances of the injury that leads to changes in attributions. Regardless of the nature of the findings, the results from both studies suggest that responsibility and blame attributions may change over time.

2.2.3.9 Limitations of Attribution Research

Four main criticisms can be made of attribution research in pain/illness/injury samples. Firstly, there is a lack of real-life research investigating empirical distinctions between cause, responsibility and blame (see section 2.2.3.4). This limits what can be learned about whether or not the concepts are distinguished from each other, and thus if it is important to examine all three concepts independently in pain/illness/injury situation. The implications of this also relate to the second criticism of attribution research. That is, despite having been theoretically distinguished from each other (see section 2.2.3.3), researchers often use the concepts cause, responsibility and blame interchangeably. Firstly, in the measurement of attributions, and secondly, in the interpretation of attribution results.

Both points are demonstrated in research conducted by Taylor et al (1984), who investigated the attribution/adjustment relationship in a sample of women with breast cancer. To address the first point, there was conceptual confusion in two of the attribution measures used in this study. Firstly, responsibility was measured through asking participants to assign a percentage of responsibility for their breast cancer to at least one of four factors: the self, others, the environment and chance. This was described as a replication of a measure used elsewhere (Bulman and Wortman, 1977). However, Bulman and Wortman (1977) used the same measure to investigate blame attributions. Thus, Taylor et al (1984) confused responsibility with blame. Secondly, responsibility was confused with cause where participants were asked to provide ratings of the "causal responsibility" of various factors in contributing to their cancer. To address the second point, the outcomes of these measures were interpreted as blame attributions.

One of the main problems with using the concepts interchangeably is that each has been found to be independently associated with adjustment to a negative situation. Thus, their interchangeable use creates problems in interpreting the nature of any attribution/adjustment associations found in studies. More research making empirical distinctions between all three concepts may reduce their interchangeable use in research.

The third criticism involves attribution measures. Specifically, the structured nature of the responsibility and blame measures often used in pain/illness/injury samples do not allow for participants to refrain from making attributions, and limits them in the types of attributions they can make. This makes it impossible to determine the extent to which these samples would make attributions when given the opportunity not to do so (see section 2.2.3.5). Associated with this, the nature of any freely made responsibility and blame attributions cannot be determined, since structured measures are largely concerned with investigating attributions made to the self and others (see section 2.2.3.7).

The final criticism is that there is a lack of longitudinal research examining the extent to which cause, responsibility and blame attributions change over time (see section 2.2.3.8). The limited available literature on this suggests they do change in chronically ill/injured patients, and the results of cross-sectional analyses supports this. However, contradictory evidence from acutely ill patients suggests attributions do not change over time. Thus, the scarcity and contradictory nature of this evidence limits what can be learned about the changing nature of the attributions in pain/illness/injury samples. The importance of investigating the changing nature of attributions for pain/illness/injury situations comes from the fact that these situations can last a long time, and as such beliefs about them may be expected to change over the course of the experience.

In summary, the present section discussed empirical literature on the extent to which attributions are made, the nature of them, and whether or not they change over the pain/illness/injury experience. The theoretical origins of cause, responsibility and blame were also outlined, and conceptual and empirical distinctions between them considered. Reasons why attributions may be made were examined. These included several motives for making them. One common motive across cause, responsibility and blame involved maintaining the belief in a just world.

2.2.4 Just World Beliefs

2.2.4.1 Introduction

Section 2.2.2 noted that the belief that life should be free of pain may exacerbate the suffering associated with chronic pain (DeGood and Tait, 2001). This section will explore this idea in relation to the available research on the interactions between just world beliefs and adjustment to pain/illness/injury. Before this, however, consideration will be given to definitions and types of just world beliefs, circumstances under which they may be threatened and maintained, and their measurement.

2.2.4.2 Defining Just World Beliefs

Individuals may react positively as well as negatively towards negative situations. Positive reactions include the maintenance of the belief in a just world. This is based on the just world hypothesis, which states that individuals have a need to maintain the belief that they live in a world where people get what they deserve and deserve what they get (Lerner, 1970; Lerner, 1980; Lerner and Miller, 1978). Associated with this is the idea that good things happen to good people, and bad things happen to bad people (Lerner, 1970). These beliefs serve an important adaptive function in that they allow individuals to view their environments as stable and orderly (Lerner and Miller, 1978), creating a predictable and manageable world (Lerner, 1980). This creates a sense of security that everything is as it should be (Lerner, 1970).

There has been some concern about whether the belief in a just world is a childhood fairytale, where the "goodies" win and the "baddies" lose in the end, or a fundamental delusion. The title of Lerner's (1980) book is, "The Belief in a Just World: A Fundamental Delusion". The belief is "fundamental", in that it is essential for security and sanity; it is a "delusion" in that it is a set of factually false beliefs (Lerner, 1998). However, although not accurate, illusions are adaptive in that they may protect individuals from the initial and intermediate stages of threat while they come to terms with their new situation (Taylor, 1983). They have also been found to have a positive impact on mental health through promoting happiness, the ability to care for others and the capacity for creative, productive work (Taylor and Brown, 1988). Illusions can be maintained in the face of contradictory evidence through alternative explanations that might maintain the illusion (Taylor, 1983). The belief in a just world is believed to be more of a fundamental delusion than a fairytale, given the complex dynamics involved in people protecting their just world beliefs (Furnham, 2003).

People may be motivated to protect and maintain their just world beliefs because of the important adaptive function they serve (Lerner and Miller, 1978). Societal rules and laws by which an individual abides dictate his/her just world beliefs (Lerner, 1998). This suggests that an individual may only be concerned that justice is maintained in his/her society, not in other societies. Indeed, Dalbert (1998) reported that individuals tend to believe more strongly in a personal world than a general world. People may also hold their own personal ideas of justice that may be emotionally biased (Lerner, 1998). Regardless of the motives behind just world beliefs, an individual may be greatly distressed if he/she comes up against evidence suggesting that the world is not just at all (Lerner and Miller, 1978).

2.2.4.3 Circumstances Under Which Just World Beliefs May be Threatened

Just world beliefs may be threatened in the presence of unjust suffering, although the extent of this threat is dependent on the strength and intensity of the belief (Lerner, 1980). Most of the just world literature is concerned with an individual's just world beliefs being threatened when witnessing the unjust suffering of another individual in a variety of situations. Just world beliefs and reactions to one's own injustice is a relatively new area of research (Hafer and Olson, 1998). The available literature on this typically refers to those who are suffering as 'victims'. However, an individual is only a victim to the extent that he/she perceives him/herself in this way. Montada (1991) proposed that whether or not a person will feel victimised by suffering depends on whether or not his/her perceived entitlements are met. These entitlements may be based on societal and legal rules of justice. Any instances where they are threatened, for example by the onset of illness, where there may be a loss of status, health, security and self-esteem, may lead an individual to feel victimised by the illness. In the present study the maintenance of just world beliefs in the face of one's own suffering (i.e. pain) will be considered.

2.2.4.4 Ways in Which Just World Beliefs Can be Maintained

When an individual has suffered an injustice, his/her just world beliefs may be maintained using several means. Lerner (1998) proposed one common way in which this may happen. He stated that adults do recognise instances where innocent people suffer and bad people win, but rather than giving up their just world beliefs, they develop various ways of neutralising the anger and anxiety resulting from this. The easiest way to do this is through 'normalising' the event for example, 'shit happens'. The idea being that if something 'bad' happens to someone through no fault of their own, the person can take comfort from the fact that these things eventually happen to everyone, and so he/she is not being unjustly singled out for victimisation. The person will be able to say that he/she is only getting a fair share of what everyone experiences. Thus, if an unpleasant occurrence is 'normal' in society, there is no injustice.

Taylor, Wood and Lichtman (1983) identified four different strategies that can be used to reduce feelings of injustice in the face of a variety of forms of victimisation, including crime, natural disaster and illness. These strategies may help an individual maintain his/her just world beliefs. Firstly, downward social comparisons can be made with less fortunate others experiencing a similar type of injustice, to allow an individual to feel fortunate in relation to others who are worse-off. Secondly, the individual may imagine that the situation could be worse, again viewing him/herself in a fortunate position. Thirdly, some benefits or meaning may be found in the harmful event. Finally, people may selectively focus on attributes that make them appear advantaged in the situation.

As indicated in section 2.2.3.5, attributions can also be made as a way of maintaining just world beliefs. Self-blame attributions can be made to reduce feelings of injustice in various situations, including illness (Montada, 1991), since in making these attributions it is possible to avoid feelings of injustice because no external agents inflicted harm, only the individual him/herself. Attributions made to one's behaviour (behavioural self-blame) may allow an individual to feel in control of the injustice with the knowledge that future injustices can be avoided by ceasing to carry out the behaviour that originally led to the injustice. Events will only be perceived as unjust when a person or institution is held responsible and liable to blame (Montada, 1992). In such circumstances, the suffering person's need for justice can be satisfied by having his/her entitlements acknowledged, being compensated in a court of law, or receiving an apology by the wrongdoer.

Causal attributions can also be made as a means of maintaining just world beliefs, because they provide explanations for an unfair situation, thereby reducing the distress associated with it (Kidd and Utne 1978; Utne and Kidd, 1980). Making causal attributions leads to a reduction in distress because they provide information about the intentions and abilities of the person creating the injustice and it is this information which reduces distress. Three types of information are provided. Firstly, it is determined whether the causes of the injustice were internal (to the individual), or external (outwith the individual). More distress will be created by external attributions as this suggests an intention to produce the injustice. Secondly, it is determined whether the cause of the injustice was stable or unstable. An injustice that has a greater likelihood of recurring (unstable) will create more distress than an injustice that occurs only once or twice (stable). Thirdly, it is determined if the cause was controllable or uncontrollable. This type of explanation interacts with the others, in that for example internal attributions are perceived as being more controllable than external attributions.

Lupfer, Doan and Houston (1998) have provided empirical support for the benefits of making causal attributions. They found high just world believers who gave a causal explanation of an unfair outcome to be less distressed than high just world believers who were not given the opportunity to provide a cause of an unfair outcome. Giving a cause was a way of justifying the unfair outcome for high just world believers. Those high just world believers who were not given the opportunity to provide a cause of the unfair outcome were more distressed because they could give no explanation to justify it, and as a result their just world beliefs were threatened.

2.2.4.5 The Measurement of Just World Beliefs

The introduction of scales to measure just world beliefs signalled a shift in research from inferring justice beliefs in experimental situations (Lerner and Miller, 1978), to measuring just world beliefs in real-life situations (Furnham and Procter, 1989). Rubin and Peplau (1973; 1975) developed a unidimensional Just World Scale to measure, "an attitudinal continuum extending between two poles of total acceptance and total rejection of the notion that the world is a just place" (Rubin and Peplau, 1975, p.66). This scale measures general just world beliefs. The original scale consisted of 19 statements corresponding to the belief in a just world, and belief in an unjust world. These statements originated from a factor analysis of data collected from 66 Boston university undergraduates.

Subsequent factor analysis of the scale items based on the responses of participants from a study of the national draft lottery (Rubin and Peplau, 1973) reduced the scale to 16 items. Nine of these items were worded in a positive direction. The extent of agreement with these items on a six-point continuum reflected some belief that the world is a just place. Seven of the items were worded in a negative direction, and agreement with these reflected a belief that the world is unjust. Subsequent research disagreed with this latter interpretation. Furnham (1985) viewed this score as reflecting low just world beliefs, instead of a belief in an unjust world. Additionally, scores on the midpoint of the whole scale have been taken to reflect a belief in a random world, although problems with this has made it difficult to determine (Furnham, 1998).

The Rubin and Peplau (1973) scale has been found to be internally consistent (coefficient alpha = 0.79). Subsequent research using 180 undergraduate students to clarify the construct of a belief in a just world led to a 20-item revised version of the scale (Rubin and Peplau, 1975). This measures justice beliefs in a variety of domains incorporating health, family, school, politics and criminal justice. Thirteen of the original 16 items were included in the scale, in addition to seven new items. Eleven of the 20 scale statements measure just world beliefs, while the remaining nine items measure unjust world beliefs. All 20 items are randomly presented in the scale. Level of agreement with each of the 20 items is indicated on a six-point continuum, from strongly agree (6) to strongly disagree (1). To score the scale, the 11 just world items are scored positively and added together, while the nine unjust world items are scored negatively and added together. Both scores are then summed to provide a total belief in a just world score out of 120, with higher scores indicating stronger just world beliefs. Coefficient alpha for the revised scale is similar to the original scale (coefficient alpha = 0.80), and it correlates highly with the original scale (0.93). Subsequent reliability estimates have varied between 0.53 - 0.81 (Furnham, 1998), providing varied levels of support for the scale reliability.

Three main criticisms have been made of the scale. Firstly, a large amount of research has been concerned with testing the psychometric properties of the scale, which have been unimpressive. For example, there is little evidence for the test-retest reliability of the scale, and validity studies have largely concentrated on concurrent rather than construct or predictive validity (Furnham, 1998). It could be argued, however, that the face, concurrent and predictive validity of the scale are satisfactory, because the scale has been found to correlate significantly and predictably with many other self-report measures (to be discussed in section 2.2.4.6). Additionally, various experimental studies using just world belief scores as independent variables have usually found them to be predictably related to specific behaviour (Furnham, 1998).

Secondly, while some factor-analytic studies have supported the unidimensionality of the scale (Ahmed and Stewart, 1985), other studies have found the scale to be multidimensional (Ambrosio and Sheehan, 1990; Caputi, 1994; Hyland and Dann, 1987; Lea and Fekken, 1993; Whatley, 1993). Indeed, the belief in a just world and the belief in an unjust world have been viewed as tapping into different belief systems, and have been found to have separate correlates (Connors and Heaven, 1987; Furnham, 1998; Furnham and Gunter, 1984; Heaven and Connors, 1988). They have also been found to load on separate factors, in factor analysis (Couch, 1998). Furnham and Procter (1989) believed the scale to be multidimensional because it is possible to hold just world beliefs about some domains in the scale and not others. This not only fails to replicate the unidimensionality of the scale, but also fails to support just world theory, the basis of which is that the belief in a just world is a single construct.

Thirdly, Lerner (1980) criticised the scale on the grounds that it taps a very naïve view of social reality. He stated that the items in the scale may not be applicable to everyone, and responses may not reflect just world beliefs so much as the socialisation processes of the individual in his/her society.

It has been suggested that the scale should be used as an index of different styles people use to maintain their just world beliefs (Furnham and Procter, 1989). This suggests that the belief in a just world is an attributional style which is activated when faced with events in which issues of justice are salient (Lupfer et al, 1998). However, the extent of a person's just world beliefs may vary depending on various factors, such as the type of day the person has had.

Given the shortcomings of the Rubin and Peplau (1973; 1975) scale, other just world scales have been developed. Lipkus (1991) developed a Global Belief in a Just World Scale that was found to be unidimensional. Subsequent research has supported the unidimensionality of the scale (O'Connor, Morrison and Morrison, 1996). A number of countries have also produced their own multidimensional just world measures in recent years (see Furnham, 2003 for a view of this literature). Additionally, measures of specific spheres of justice, rather the global justice beliefs have been introduced (Furnham and Procter, 1992; Paulus, 1983). For example, Maes (1998) identified two main types of just world beliefs. The first is a belief in 'immanent justice', which holds that present suffering is punishment for past deeds, and a second belief in 'ultimate justice'; the notion that consolation for a present injustice on earth is provided through the promise of a higher justice, perhaps in another world. This latter type of belief may be evident in highly religious people. Although both types of belief allow an individual to cope with injustice, the belief in ultimate justice may be more adaptive since it allows an individual to adapt easily to a present injustice with the thought that a solution to the injustice will be provided in the future. In support of this, highly religious people have been found to view more justice than injustice in everyday life-events (Pepitone and L'Armand, 1996), than people with low religious beliefs. The belief in immanent justice may lead to rumination that present suffering is a punishment for past deeds, and thus poor adaptation (Maes, 1998). Maes developed a scale to measure immanent and ultimate justice beliefs, and found both to be internally reliable and correlate with the full belief in a just world.

Despite the development of new just world beliefs measures, the Rubin and Peplau (1973; 1975) scale has been used for over 20 years to measure just world beliefs (Furnham, 1998). Indeed, despite its shortcomings the scale opened up a new area of research for just world theory. It provided a measure that could be used to provide direct links between the way people react to events in their environment, and their just world beliefs. Moreover, with its widespread use the scale has been found to be remarkably robust (Furnham, 1998; Furnham and Procter, 1989). The scale has been used in varied research areas including juror behaviour, general attitudes towards justice, accidents, misfortunes, and fate. The samples in these studies have largely consisted of North American students. These studies have found the belief in a just world to correlate with many factors including the protestant work ethic, conservatism, social attitudes towards the poor, locus of control, personality, authoritarianism, and trust (Furnham and Procter, 1989; Rubin and Peplau, 1975). Correlates of the belief in a just world have also been found in research on those who are suffering. This will now be considered.

2.2.4.6 Correlates of Just World Beliefs in Situations of Personal Suffering

Correlates of the Rubin and Peplau (1973; 1975) scale have been found among those who are suffering in both experimental and real-life situations. Many experimental correlates of the belief in a just world have been found, and so only an example of these will be given here. This research has been concerned with differences between those with different strengths of just world beliefs. High just world beliefs have been associated with positive outcomes such as less stress (Lipkus, Dalbert and Siegler, 1996; Tomaka and Blascovich, 1994), less depression (Lipkus et al, 1996), and greater well-being and life satisfaction (Lipkus et al, 1996), than those with weaker just world beliefs. Those with high just world beliefs have also been found to view their injustice as more 'fair' than those with weaker just world beliefs (Hafer and Olson, 1989; 1998). There are also many correlates of the belief in a just world in various real-life suffering situations. For example, in unemployment situations a high belief in a just world has been associated with low depression scores (Benson and Ritter, 1990; Ritter, Benson and Snyder, 1990).

High just world beliefs have not always been associated with adaptive outcomes. They have also been associated with such negative outcomes as disappointment and anxiety to poor student grades (Hafer and Olson, 1998). However, most of the correlates reviewed suggest that high just world beliefs are adaptive in the face of personal suffering. Dalbert (1998) proposed that just world beliefs might be functional because they help a person deal with daily life struggles, through reducing the possibility of depression and other stress-induced illnesses.

2.2.4.7 Limitation of Just World Research

There has been a scarcity of literature investigating the just world beliefs of those suffering from real-life pain and related illness/injury conditions. Only three articles have been found to do this, in spinal-injured (Bulman and Wortman, 1977; Heinemann et al, 1988), and burns patients (Kiecolt-Glaser and Williams, 1987). In these samples just world beliefs were correlated with happiness (Bulman and Wortman, 1977), and self-blame (Kiecolt-Glaser and Williams, 1987).

This lack of research is surprising because the physical, social, economic and psychological impacts of pain on an individual are likely to be perceived as unfair and challenge the extent to which he/she believes the world to be a fair and just place. Additionally, if one believes that life should be free of pain, the experience of pain is likely to exacerbate the suffering associated with it. Both points suggest that a person's just world beliefs may be influenced by pain.

Given that the experience of pain may be expected to influence a person's just world beliefs, it is important to measures these beliefs in pain sufferers because they may influence how a person adjusts to his/her pain. Just world beliefs have been associated with psychological adjustment to a temporary negative personal situation, such as the loss of a job (Benson and Ritter, 1990; Ritter et al, 1990). This being the case, it would be expected that they would also be associated with longer-term negative personal situations, such as pain/illness/injury.

2.2.5 Adjustment

2.2.5.1 Introduction

In their review of the chronic pain literature, Jensen et al (1991) noted that some chronic pain sufferers seem to adapt to their pain situation better than others. From this they proposed a need to identify factors leading to good adjustment. Before this can be undertaken, adjustment needs to be defined. The present section will define adjustment, and identify ways in which it has been measured. The section will end with a consideration of the associations between pain beliefs and adjustment.

2.2.5.2 Defining Adjustment

Adjustment is a multidimensional concept that has been defined in several ways. Adjustment outcomes commonly identified across pain, illness and injury literature loosely fall under three main groupings: health, psychological, and functioning. The outcomes falling under health include general health (Lazarus and Folkman, 1984), self-reported pain severity, and various pain management strategies, including medication use and health services use (Jensen et al, 1991). The outcomes falling under psychological factors include issues associated with satisfaction in one's life, morale (Lazarus and Folkman, 1984), and various emotional indicators. These involve both positive affect (Roesch and Weiner, 2001), and negative affect, such as depression, distress, anger, anxiety and hostility (Jensen et al, 1991; Roesch and Weiner, 2001).

Both physical and social functioning outcomes have been identified in the literature. Physical outcomes include pain behaviour, mobility, and daily functioning, including living skills (domestic environment functioning), and work functioning (Bar-on, 1987; Berckman and Austin, 1993; Jensen et al, 1991; Lowery et al, 1983). Social functioning outcomes have included both social functioning in general, and specific outcomes in terms of the way an individual fulfills his/her various roles in society, for example as a parent, job holder and community member (Lazarus and Folkman, 1984).

Despite the fact that adjustment is independent of coping (Jensen et al, 1991; Roesch and Weiner, 2001), one problem in defining adjustment is that it has been closely associated with coping, in the following ways. Firstly, it has been used interchangeably with coping (Silver and Wortman, 1980; Wortman, 1983). Secondly, adjustment has been taken as one meaning of coping (Michela and Wood, 1986), and thirdly, some coping measures are confounded by items that reflect adjustment constructs (Jensen et al, 1991). In support of this, PSYCHINFO database searches on adjustment and pain/illness tend to produce coping literature.

2.2.5.3 Measuring Adjustment

Adjustment has been measured using both single and multiple adjustment outcomes. The use of multiple adjustment measures has been criticised. Firstly, combinations of unrelated adjustment components have been reported to be unreliable (Turnquist et al, 1988). Secondly, the use of multiple adjustment measures may make it impossible to evaluate the overall adjustment of one person. This is because a response may be beneficial to one domain of adjustment, but detrimental to another. For example, a persons' optimistic outlook may lead him/her to be free of negative emotions, but neglect treatment regimes (Michela and Wood, 1986).

Adjustment measures tend to be either self-report in nature or ratings by other people such as spouses and health professionals of their perceptions of patient adjustment. The ratings often take the form of Likert scales, which require participants to numerically score the intensity of their attitudes towards something. One criticism of the use of self-report measures is that they may be subject to bias. For this reason it has been suggested that observational measures of patient functioning should be used instead (Jensen, Turner, Romano and Lawler, 1994). However, Jensen, Romano, Turner, Good and Wald (1999) found patient beliefs to be associated more with self-report than observational measures of adjustment. One other consideration is that reliance on self-report measures poses the risk that shared method variance may explain some of the associations found between measures (Jensen et al, 1999). For example, a strong relationship between beliefs about being disabled by pain, and physical disability adjustment measures may be attributable to the possibility that both are tapping into the same dimension, rather than there being a real association between disability and the specific belief.

In addition to addressing issues concerning the type and nature of adjustment measures, consideration has also been given to their timing. Turnquist et al (1988) stated that the timing of the assessment of adjustment needs to be considered, since longitudinal studies of illness and injury indicate changes in domains of adjustment over time. For example, at diagnosis issues of emotional adjustment are strongest, while issues of physical activity and occupational functioning may become more important during recovery.

2.2.5.4 The Pain Belief/Adjustment Relationship

Negative pain beliefs have been found to be associated with poor adjustment to pain. For example, the belief in the permanency/constancy of pain has been associated with poor psychological adjustment (Herda, Siegens and Basler, 1994; Williams et al, 1994), and greater pain intensity (Williams and Thorn, 1989). Similar negative adjustment outcomes have been found for the belief in pain as being something mysterious. In addition, the belief in oneself as disabled has been found to be associated with poor physical and psychological functioning (Jensen and Karoly, 1992; Jensen, Turner and Romano, 1994), while the belief that pain signals harm and is organic in origin has been associated with poor physical functioning (Jensen et al, 1999; Walsh and Radcliffe, 2002). Positive pain beliefs have been found to be associated with good adjustment. Jensen and Karoly (1991) found that the more that chronic pain sufferers felt in control of their pain, the better psychologically-adjusted they were to their condition.

Pain severity has been found to mediate the pain belief/adjustment relationship. Jensen and Karoly (1991) found perceived pain controllability to be strongly associated with activity level for those reporting low levels of pain severity. Additionally, Jensen and Karoly (1992) found the belief in oneself as disabled to be associated with low activity level only for those reporting low or medium levels of pain severity. These results suggest that pain beliefs are more strongly related to adjustment for patients reporting relatively low levels of pain. They should, however be interpreted with caution given that subsequent research has failed to replicate them (Jensen et al, 1999).

2.2.6 Summary

The second section of the chapter described the background and theoretical origins of attributions, just world beliefs and adjustment to pain/illness/injury. Three types of attributions were identified: cause, responsibility and blame. Conceptual and empirical distinctions between them were discussed, along with reasons for making them, in terms of their measurement and motives. Few studies have measured spontaneous attributions, making it impossible to determine the extent to which attributions are freely made. Some idea of this was taken from research using unstructured measures, suggesting that causal attributions for the onset of pain/illness/injury are made by between 69 - 95% of people suffering from these conditions. These are disease-specific. However, the nature of and extent to which responsibility and blame attributions are made are more difficult to determine due to discussed limitations of attribution research. Limitations in research examining the extent to which cause, responsibility and blame attributions change over the course of a pain/illness/injury experience was also considered.

Different types of just world beliefs were identified, and circumstances under which they may be threatened in situations of personal suffering examined. These include that the possible loss of health, status, security and self-esteem as a result of illness may leave an individual feeling victimised by the illness, challenging the extent to which he/she feels the world is a just place. Various ways in which just world beliefs may be maintained when faced with the unfairness of personal suffering were outlined. Additionally, an overview of the Rubin and Peplau (1973; 1975) Just World Scale was provided, and criticisms of the scale reported. Correlates of the scale in both experimental and real-life situations of personal suffering were briefed. This suggested that high just world beliefs might be adaptive in the face of personal suffering. The section ended with an overview of the limitations of just world research.

The final part of the second section described adjustment. This was defined in terms of three outcomes: health, psychological and functioning. Ways in which adjustment has been measured and problems associated with this were discussed. The section ended with an investigation of associations between pain beliefs and adjustment. This indicated that positive pain beliefs are associated with good adjustment to pain, while negative pain beliefs are associated with poor adjustment to pain.

2.3 THE ATTRIBUTION/ADJUSTMENT RELATIONSHIP IN PAIN/ ILLNESS/INJURY

2.3.1 Introduction

In addition to just world and pain beliefs, attributions also have implications for adjustment to the pain experience. The third and final section of the chapter will review research on associations between cause, responsibility and blame attributions, and adjustment to pain/illness/injury, in five sections. The first two sections will deal with associations between adjustment outcomes and causal attributions, followed by responsibility and blame attributions. The third section will outline individual differences in attributions and adjustment, and the fourth section will critique this research. This will be followed by a conclusive summary of the attribution/adjustment relationship.

2.3.2 The Causal Attribution/Adjustment Relationship

2.3.2.1 Introduction

The causal attribution/adjustment relationship will be considered in two sections: chronically-ill samples, and acutely-ill samples, before an overall summary of this relationship is provided.

2.3.2.2 Chronically Ill Samples

Lowery et al (1983) examined the causal attribution/adjustment relationship in a sample of 55 male rheumatoid arthritis sufferers recruited from the arthritis clinic of a medical centre on average 12 years after the arthritis onset. The mean age of the sample was 58 years. Causal attributions were measured through asking participants if they had ever considered the question, "Why me?" in relation to their situation. Adjustment was measured using both psychological and physical functioning outcomes. Three main findings were reported. Firstly, those who did not make a causal attribution for their arthritis were more poorly psychologically adjusted in terms of being more anxious, depressed and hostile, than those who did. However, other research using a similar method and illness duration reported no differences in the psychological adjustment of both groups (Lowery et al 1987). This difference can be attributed to the fact that Lowery et al (1987) distinguished the use of "Why me?" from making causal attributions at the time of the interview, while Lowery et al (1983) did not do this. This distinction is important because both have been independently associated with adjustment. Causal attributions have consistently held mixed associations with adjustment, while previously considering "Why me?" has been consistently associated with poor adjustment (Affleck et al, 1987a; Lowery et al, 1987; Lowery et al, 1993).

Secondly, Lowery et al (1983) found some attributions were better associated with adjustment than others. Specifically, those who made attributions to the environment or personal habits scored lowest on measures of anxiety, depression and hostility.

Those who cited hereditary factors and fate as causes of their arthritis scored higher on these measures. This suggests some attributions lead to better adjustment than others. However, other research has found no attribution/adjustment relationship in rheumatoid arthritis patients (Affleck et al, 1987a). This conflict may be a reflection of two variations in method between studies. Firstly, there were sample differences in that the 92 rheumatoid arthritis sufferers in Affleck et al (1987a) were slightly younger (mean = 50.4 years) with a slightly shorter illness duration (mean = 9.91 years), than the Lowery et al (1983) sample. Additionally, they were largely female, compared to the male sample in the Lowery et al (1983) study. Secondly, different adjustment measures and methods of administration were used in both studies. In the Affleck et al (1987a) study health care professionals rated the psychological adjustment of their patients, while in Lowery et al (1983) participants rated their own psychological adjustment. Both studies have in common a third finding of Lowery et al (1983), that attributions were unrelated to daily functioning and living skills.

Affleck et al (1987a) suggested an alternative explanation for these contradictory results. They found that although causal attributions were unrelated to psychological and physical adjustment in their rheumatoid arthritis sample, attributions for symptom flares and remissions were related to both types of adjustment. From this the authors proposed that causal attributions for patterns of disease severity might play a greater role in adaptation to rheumatoid arthritis than causal attributions for the condition itself.

The latter of these explanations for the contradictory findings seems more plausible when considering that consistent causal attribution/adjustment results have been found in breast cancer sufferers, despite both methodological differences and similarities in the studies investigated. Similarities include that all breast cancer sufferers were recruited from specialised cancer treatment centres, and were of a similar age (mean = 53-56 years) (Lavery and Clarke, 1996; Lowery et al, 1993; Taylor et al, 1984). Three main differences have been identified. Firstly, various types of attribution and psychosocial adjustment measures were used in the studies. These were administered in different ways, using both interview (Lowery et al, 1993; Taylor et al, 1984), and mailed questionnaire formats (Lavery and Clarke, 1996). Secondly, varied ranges of illness durations have been adopted across studies, ranging from 13.9 months (Lowery et al, 1993) to 25.5 months (Taylor et al, 1984) and 9.1 years (Lavery and Clarke, 1996). Thirdly, there have been large differences in the number of breast cancer sufferers comprising the samples of each study, ranging from 78 participants (Taylor et al, 1984), to 195 participants (Lowery et al, 1993) and 394 participants (Lavery and Clarke, 1996). Despite this, the results of all studies indicated no differences in adjustment to cancer between those who made a causal attribution for their cancer and those who did not. Additionally, no particular attributions were associated with adjustment. These findings suggest causal attributions are not important for adjustment to breast cancer.

Indeed, while there was little relationship between causal attributions and adjustment, Taylor et al (1984) found various types of control to be positively associated with adjustment. Additionally, Lowery et al (1993) found a negative association between control and adjustment, such that feelings of a loss of control since the breast cancer diagnosis were associated with poor psychological adjustment. The fact that control rather than causal attributions was associated with adjustment may be explained by the nature of the condition. For permanent conditions such as spinal cord injuries where there is no threat of a recurrence of the injury, making a causal attribution may allow an individual to take meaning from and control of the uncontrollable situation, and this may be associated with good adjustment. However, for conditions such as breast cancer, which can recur, giving a causal attribution may not help adjustment to the situation. Instead, taking control over the cancer in order to avoid a recurrence may be more adaptive (Taylor et al, 1984).

A causal attribution/adjustment association has been found in lung cancer patients. Berckman and Austin (1993) investigated this relationship in their sample of 61 largely male lung cancer sufferers with a mean age of 60 years, and illness duration of 19.8 years, recruited from private general practices and hospital radiation and chemotherapy departments. Causal attributions were measured using both structured and unstructured measures. A psychosocial measure was used to measure adjustment in terms of health, psychological and functioning outcomes.

The main outcome of this study was that those cancer sufferers who gave both internal attributions such as smoking, and external attributions such as air pollution for their lung cancer experienced poor psychosocial adjustment to their lung cancer in relation to their domestic and social environments, and were psychologically distressed. Using a similar sample, Faller et al (1995) found psychosocial attributions such as inner anxieties, nervousness and insufficient ability to cope with stress and crises to be associated with higher emotional distress, less hope, and higher depression levels. Few positive causal attribution/adjustment associations were found. The fact that causal attributions were associated with adjustment in male lung cancer sufferers, but not female breast cancer sufferers indicates gender differences may be contributing to these results. However, negative association in the lung cancer sample, combined with the lack of a causal attribution/adjustment association in breast cancer sufferers suggests that causal attributions are not beneficial for adjustment to a cancer situation. Although control was found to be beneficial for adjustment to breast cancer (Lowery et al, 1993; Taylor et al, 1984), Berckman and Austin (1993) found perceived control over lung cancer to be unrelated to adjustment. This suggests other factors may be important for adjustment to lung cancer.

The literature reviewed thus far suggests making causal attributions for the onset of both a life-threatening (cancer) and non life-threatening (rheumatoid arthritis) chronic illness is either not relevant or beneficial for adjustment to the illness. Instead, there are issues specific to the nature of the illness that may be better for current adjustment. In rheumatoid arthritis sufferers this is attributions for current symptoms, and in breast cancer sufferers this is taking current control of the cancer. Both indicate that rather than causal attributions for the onset of a negative situation which may have occurred months or even years earlier, current attributions may help adjustment to the situation now. In order to explore this further, the causal attribution/adjustment relationship will be considered in acutely ill samples. This is because in acute illness situations (i.e. of a short duration) attributions and adjustment are investigated for the same time. In these samples it is recovery rather than adjustment outcomes which are investigated. However, they are similar to adjustment outcomes in terms of including health, psychological and functioning measures.

2.3.2.3 Acutely Ill Samples

Causal attributions have both short and long-term implications for recovery from acute illness. In the short-term, Lowery et al (1987) found in their sample of 83 largely male first-time myocardial infarction sufferers recruited from hospital (mean age = 60 years), that those who gave a cause of their illness were more poorly adjusted to the situation than those who did not provide a cause. Specifically, they were more anxious, depressed and hostile, and were less optimistic about their perceptions of future recovery. Additionally, DuCette and Keane (1984) found some attributions to be better associated with adjustment than others in their sample of 90 predominantly male acute surgical patients, with a mean age of 55 years. Those who attributed their illness to such things as heredity factors had better recoveries in terms of both general outcomes (such as ability to eat, sleep, absence of nausea), and activity outcomes (such as the ability to move). Those who attributed their illness to such things as bad habits made poorer recoveries in terms of general health outcomes.

Meana, Binik, Khalife and Cohen (1999) also found some attributions to be better associated with adjustment than others in their sample of 100 dyspareunia sufferers recruited from the community. Those who attributed their condition to psychosocial causes including anxiety and relationship problems had poorer emotional adjustment and higher pain levels than those who gave physical attributions (such as lack of lubrication, unresolved vaginal infection), for their condition.

Although these results indicate some causal attributions are maladaptive, they also suggest some are beneficial for recovery from acute illness. DeValle and Norman (1992) provided a good example of why this may be the case. They found an association between the causal attributions made by first-time myocardial infarction sufferers for their condition, and subsequent health-behaviour changes. For example, those who had reduced their alcohol intake since their myocardial infarction were likely to attribute their myocardial infarction to excessive alcohol intake, and attributions to smoking were associated with a reduction in smoking behaviour. Petrie and Weinman (1997) found similar associations in their myocardial infarction sample, although this has not always been the case. Croog and Richards (1977) found no association between attributions to smoking and subsequent smoking behaviour. Despite this, these results suggest an association between making attributions and immediate outcomes, such that as a result of making certain causal attributions health behaviours may change, with the effect of facilitating recovery and offsetting another myocardial infarction in the long-term.

Bar-on (1987) investigated long-term associations between causal attributions and recovery in a sample of 89 male first-time myocardial infarction sufferers, whose mean age was 49 years. All were interviewed three times: within 48 hours of hospital admission, 2 - 3 weeks later, before being released from hospital, and at a regular clinic check-up, 4 - 6 months after the myocardial infarction. Causal attributions were measured using a structured measure where all participants had to select causes of their myocardial infarction from a list. Outcome measures consisted of a measure of return to work and functioning, including physical, sexual and workload functioning, compared with their pre-myocardial infarction functioning. In addition, a medical rehabilitation measure was used to examine each participant's health status. A factor analysis of the causal responses produced five main factors, two of which were classed as "Fate and Luck", taken to be external to the person and uncontrollable, and "Limits and Strengths", which were taken to be internal and controllable. The remaining three factors are not discussed in the current analysis.

Neither factors were associated with the medical rehabilitation outcomes. However, both were correlated with the return to work and functioning measure. Those who made causal attributions to fate and luck at the end of hospitalisation returned to work to a lesser extent, and rated their functioning as significantly lower than patients who made attributions to limits and strengths. Similar outcomes of attributions to fate were reported in earlier work (Bar-on, 1983). At a follow-up one year later, the significant effect of attributions to fate and luck was maintained. The fact that attributions helped account for rehabilitation after a first myocardial infarction in the present study, led

Bar-on to suggest that early attribution choices may lead patients to plan different routes of, for example, behaviour change, to avoid the possibility of a future myocardial infarction. The results of DeValle and Norman (1992), and Petrie and Weinman (1997) support this.

Affleck et al (1987c) investigated the power of causal attributions and perceiving benefits over a myocardial infarction in predicting a second attack eight years later. Two hundred and five participants were interviewed both at seven weeks and eight years after a myocardial infarction. All were male, largely in the 50 - 59 year age range, and were recruited from the hospitals in which they were being treated. Causal attributions were measured using a list of causes contributing to a heart attack. Various health status outcomes were used, and participants were asked about any benefits or gains that they had taken from their myocardial infarction. It was found that seven weeks after a first myocardial infarction, the tendency to attribute the attack to such factors as "stress" and "worry", and the failure to perceive any benefits was predictive of morbidity at eight years. Additionally, the failure to perceive any benefits from the experience, coupled with the tendency to make attributions to others for the myocardial infarction, were associated with a high incidence of re-infarction eight years later.

Conflicting results have been reported in literature that found those who did perceive benefits of their myocardial infarction were more likely to suffer a second myocardial infarction eight years after a first attack (Low et al, 1993). Low et al (1993) also identified certain attributions that were predictive of a second myocardial infarction, where 50% of those who attributed their attack to their marriage/spouse suffered a second heart attack. This result was explained in terms of the fact that the attributions may have led to feelings of victimisation, resulting in a poor prognosis. One explanation for the contradictory findings between Low et al (1993) and Affleck et al (1987c) involves differences in the samples and attribution measures used in both studies. The sample in the Low et al (1993) study were female, and were asked what they thought caused their heart attack. However, the sample in the Affleck et al (1987c) study were male, and were provided with a structured list from which to select causes of their heart attack. It may be that the attributions made by the female myocardial infarction sufferers and the feelings of victimisation associated with them overrode any benefits they had taken from their experience, and together both predicted a second heart attack.

One criticism of the longitudinal investigations of Bar-on (1987), Affleck et al (1987c) and Low et al (1993) is that the authors did not report what happened in the time period between the initial investigation and follow-up investigations. As such, it cannot be ruled out that certain life experiences may have mediated the influence of causal attributions on subsequent adjustment. In support of this idea, in their meta-analytic review of the causal attribution/adjustment relationship, Roesch and Weiner (2001) found attributions to be indirectly associated with adjustment through certain coping methods. From this they proposed that causal attributions might interact with other variables to predict adjustment. Some of these variables may be overt, including perceived invulnerability, control and self-esteem (Macleod, 1999; Timko and Janoff-Bulman, 1985). Other variables may be undetected. This might explain why in some studies an association is found between attributions and adjustment, and not in others (Macleod, 1999).

2.3.2.4 Conclusions: The Causal Attribution/Adjustment Relationship

Three main conclusions can be drawn about the nature of the causal attribution/adjustment relationship from the literature reviewed. Firstly, making causal attributions may be more adaptive for some conditions (a myocardial infarction), than others (rheumatoid arthritis and cancer). Secondly, the fact that causal attributions were found to be more adaptive in acute than chronic illness in general suggests that causal attributions for a situation now may be more adaptive for adjustment to the situation now, than investigations between retrospective attributions and current adjustment. This suggests a third point, that perhaps causal attributions have implications for recovery from an acute illness, regardless of the nature of the associations found. Causal attribution/adjustment associations may be poor/lacking in chronic illness conditions because other factors may be important for adjustment to these longer-term conditions.

2.3.3 The Responsibility/Blame/Adjustment Relationship

2.3.3.1 Introduction

This section will consider associations between adjustment and responsibility/blame attributions to the self and others, in the following way. Firstly, a key study in the area, the Bulman and Wortman (1977) study, will be described. Secondly, research supporting the study findings, and thirdly, research that fails to do this will be discussed. The fourth section will explain the failure to replicate Bulman and Wortman's (1977) findings, one of which will lead to a fifth section examining the associations between types of self-blame and adjustment. Finally, research on the associations between specific types of other-blame attributions and adjustment will be considered.

2.3.3.2 The Bulman and Wortman (1977) Study

Bulman and Wortman (1977) carried out the earliest study investigating the self-blame /adjustment relationship, in a sample of 29 largely male spinal-injured patients. The mean age of the sample at the time of the injury was 23 years. They were recruited from an inpatient rehabilitation programme. All had been injured as a result of a variety of accidents, the most frequent of which were automobile accidents. These had occurred in the year prior to being interviewed. Self-blame for the injury sustained was examined using two measures: one with a question requiring participants to answer using a Likert-scaled response, and a structured measure, where participants had to assign a percentage of blame for their injuries to the self, others, the environment and chance factors. Adjustment was not measured in this sample. Instead, a coping measure was used, where nurses and social workers involved with each patient rated how well they thought the patient under their care was coping with their situation. Participants were also asked about the extent to which they perceived they could have avoided the accident, and about their perceived happiness.

Factor analysis of both self-blame measures produced a composite blame score that was used in subsequent analyses. Multiple regression analyses revealed the best predictors of coping to be blaming other people (r = 0.47), blaming the self (r = 0.65), and perceived avoidability (r = 0.60), such that the more another person was blamed, or the more the participants believed they could have avoided the accident, the worse they coped. However, the more the participants blamed themselves, the better they coped. One other indicator of the adaptiveness of self-blame attributions is that those who made these attributions reported themselves to be happier than those who blamed other people for their spinal injuries. Perceived avoidability of the accident was found to be a predictor of self-blame. However, self-blame was associated with good coping, and perceived avoidability was associated with poor coping. In order to investigate this apparent contradiction further, median splits were obtained for self blame (high and low), perceived avoidability (high and low), and coping (high and low). This revealed that those who placed a high amount of blame on themselves and did not feel they could have avoided the accident were most likely to be good copers than poor copers. Conversely, those who placed little blame on themselves and felt they could have avoided the accident were more likely to be poor copers than good copers. These results suggest that perceived avoidability of the accident leading to the injury mediated the self-blame/adjustment relationship. Subsequent research has supported this (Schulz and Decker, 1985).

2.3.3.3 Studies in Support of Bulman and Wortman's (1977) Findings

Some research has supported Bulman and Wortman's (1977) findings of the adaptiveness of self-blame and maladaptiveness of other-blame. Lambert and Falconer (2001) found self-blame to be associated with better adjustment than other-blame in their sample of hospitalised burns patients. Specifically, those who blamed themselves for their injury were less susceptible to posttraumatic stress disorder (PTSD), and were less distressed than those who blamed others for their injury. Delahanty, Herberman, Fullerton, Ursano, Craig and Hayward (1997) supported these findings in their investigation of responsibility attributions for motor vehicle accidents (MVA) in 173 predominantly male MVA sufferers (mean age = 36 years) over a one-year period following the accident: 14-21 days after the accident, and then 3, 6 and 12 months later. They were recruited from the trauma centre of a metropolitan hospital. All participants were asked who they thought was responsible for the accident. Both general health (e.g. heart rate) and psychological (distress, intrusive thoughts, PTSD) measures were completed at various different times over the one-year period.

To summarise the main findings, those who had been in an accident for which other people were responsible reported more long-term distress, and were more likely to be diagnosed with PTSD than those who reported being responsible for their own accident. Three months after the accident, those who reported other people to be responsible felt more threatened by the accident and reported thinking that they would experience the same kind of event again. From this the authors proposed that these respondents experienced a loss of confidence in their ability to control future driving incidents. In addition, while both the self and other-responsible groups experienced intrusive thoughts, those who had originally attributed responsibility to others experienced more intrusive thoughts across all time periods. The authors stated that this might indicate either self-attributions for the accident buffered its long-term impact, or something about not being responsible for the accident made adjustment more difficult.

Support for the benefits of attributing responsibility to the self has also been reported in people suffering from Aids Related Complex (ARC), although not in people suffering from AIDS (Moulton et al, 1987). These differences were attributed to the nature of both conditions. AIDS is thought to end in death, so making attributions to the self for a condition which is unchangeable and severe is likely to be more distressing than making attributions to such factors as other people or chance. This would not be expected in the ARC group, because although severe, the condition is thought to be changeable. Indeed, self-attributions for improvement in the condition were associated with an increase in health behaviour change in this group. These results contribute to the point made in section 2.3.2.3 about the attributions made for a situation, and subsequent behaviour change.

2.3.3.4 Studies Failing to Support Bulman and Wortman's (1977) Findings

Other studies using similar spinal-injured samples to Bulman and Wortman (1977) have failed to support their findings. Schulz and Decker (1985) investigated the nature of the self-blame/adjustment relationship in their sample of 100 mostly male spinal injured patients with a mean age of 56 years. All were recruited through agencies and institutions working with spinal injured persons in community settings. The authors found self-blame attributions to be negatively correlated with psychological well being (r = -0.13), and depression (r = -0.25), suggesting self-blame is not adaptive. Although one positive correlation was found between self-blame and life satisfaction (r = 0.23), this was weak in comparison to that found between self-blame and coping in the Bulman and Wortman study (r = 0.65).

Nielson and MacDonald (1988) investigated the self-blame/adjustment relationship in a younger sample (mean age = 36 years) of 58 mostly male spinal-injured patients. All were recruited through a spinal cord injury unit. As in Bulman and Wortman (1977), the authors split the sample into high and lower self-blamers. They found high self-blamers to be more poorly psychologically adjusted to their injury, in terms of being more anxious, depressed and hostile, than low self-blamers on average 7.4 years after the initial injury occurred, thereby failing to support the reported beneficial role of self-blame. Some responsibility research has also failed to support Bulman and Wortman's (1977) findings. Heinemann et al (1988) employed a sample with similar characteristics to that in Nielson and MacDonald (1988), and found responsibility attributions to the self and others in their spinal-injured sample to be not associated with any measures of adjustment, such as disability acceptance or happiness.

2.3.3.5 Explanations for the Failure to Support Bulman and Wortman's (1977) Findings

Three main differences in method employed across studies may account for the failure to replicate Bulman and Wortman's (1977) findings. Firstly, various adjustment measures used may have affected the results found. Bulman and Wortman (1977) used a single coping measure that was completed by healthcare professionals to rate the coping of spinal-injured patients, while standardised self-rated adjustment measures were used in the other spinal-injured samples. However, even where the same method to Bulman and Wortman (1977) has been employed, there has been a failure to produce the same results. In their replication of the Bulman and Wortman study Sholomskas et al (1990) found self-blame to be unrelated to coping, although they replicated the association between other-blame and poor coping to a negative event. The authors attributed the failure to replicate the self-blame results to the fact that the level of other-blame could have been affecting the predictive power of self-blame, and as such were stronger predictors of coping.

Secondly, the context in which the attributions were made may have influenced their associations with adjustment. The Bulman and Wortman (1977) sample were recruited from an inpatient rehabilitation programme, while the samples in the studies that failed to support this study were recruited from various external agencies working with people who have spinal injuries. These samples may have had their own biases that could have influenced the attribution/adjustment associations found. In support of this, Rich et al (1999) found the benefits of other-blame attributions for end-stage renal disease to be context-dependent. Specifically, for those who carried out their own dialysis treatment at home, blaming others for their condition was associated with anger and anxiety because this was inconsistent with the amount of autonomy this form of dialysis requires, resulting in conflict and poor adjustment. For those who had their dialysis treatment carried out by staff in hospital, blaming others for their situation was associated with a decrease in anxiety and minimal anger. This was because they were dependent on health professionals, and so blaming others for their condition was consistent with the realities of this type of treatment.

Thirdly, the timing of the attribution/adjustment relationship could have contributed to the failure to support Bulman and Wortman's (1977) findings. In the Bulman and Wortman (1977) study and subsequent research in support of their findings, the associations between self and other-blame with adjustment were investigated up to one year after the injury onset. Positive self-blame/adjustment associations were found at this time. However, a longer time since injury onset (between 7 - 20 years) was used to investigate the attribution/adjustment relationship in research that failed to support this, finding either poor or no self-blame/adjustment associations. The authors in these studies proposed from this that the relationship might be stronger nearer the time of injury onset but become weaker the longer the time from injury onset. This contributes to the conclusions drawn in section 2.3.2.4 about the causal attribution/adjustment relationship. Together, both suggest that there may be more of an attribution/adjustment relationship in general and positive relationship in particular when both are investigated for the same time, than when retrospective attributions are paired with current adjustment.

Brewin (1984) found the more his sample of acutely injured industrial accident sufferers made attributions to themselves for their accidents, the less tense and anxious they felt, and the more alert and active they were. This suggests self-blame is associated with good adjustment around the time of injury onset. Other research, however, has failed to support the benefits of self-blame around the onset of a condition. Kiecolt-Glaser and Williams (1987) found that the more those in their hospitalised acute burns sample blamed themselves for their situation, the less they complied with nurses, and the more pain behaviour and depression they displayed. Additionally, interactions were found between adjustment outcomes, in that poor compliance with nursing staff was associated with depression and anxiety, and patients who were distressed also showed more pain behaviour.

In addition to these methodological variations, one other point involving different types of self-blame may also help to explain the failure to replicate Bulman and Wortman's (1977) findings. Given that behavioural self-blame has been described as adaptive and characterological self-blame maladaptive (see section 2.2.3.2), it may be expected that any positive self-blame/adjustment associations are reflecting behavioural self-blame, while poor associations reflect characterological self-blame. In order to determine if each type of self-blame is adaptive in the way suggested, there is a need to investigate their independent associations with adjustment. Research investigating the self-blame attributions of cancer sufferers has examined these associations.

2.3.3.6 The Behavioural/Characterological Self-Blame/Adjustment Relationship

Timko and Janoff-Bulman (1985) distinguished between behavioural and characterological self-blame in their study examining perceived invulnerability, and adjustment in 42 breast cancer sufferers recruited through 12 physicians. The mean age of the sample was 53 years, and all were interviewed between 1-20 months post-mastectomy. Both types of self-blame were investigated through asking participants to make ratings of the extent to which they believed they got cancer because of type of personality they had (characterological) or because of their past behaviour (behavioural). Adjustment was measured using several indicators including depression, and through asking the extent to which the participants experienced a range of positive and negative emotions. Both types of self-blame were indirectly related to adjustment through feeling invulnerable to a recurrence of the cancer. Characterological self-blame attributions were negatively associated with good adjustment, while behavioural self-blame attributions were positively associated with good adjustment.

The effects of these types of self-blame have also been investigated longitudinally. Malcarne et al (1995) investigated associations between these attributions and perceptions of control over disease progression and recurrence as predictors of psychological distress in a sample of 72 males and females suffering from various forms of recently diagnosed cancer. All were recruited through cancer clinics. The mean age of the sample was 43 years. Each participant was interviewed twice: once around the time of diagnosis and a second time four months later, after treatment. Behavioural and characterological self-blame were measured in the same way as in Timko and Janoff-Bulman (1985).

Psychological distress at the first interview was related to characterological self-blame at the second interview. From this, the authors suggested characterological self-blame appears to play a role in the psychological adjustment to cancer during the early months surrounding diagnosis and treatment. Additionally, characterological self-blame and psychological distress had a reciprocal relationship in that both predicted each other four months later. However, there were no beneficial effects of behavioural self-blame. The authors explained this by suggesting that it might be naïve to assume behavioural self-blame could be adaptive over relatively short periods of time. The benefits of this may only emerge as part of a larger process of coping with illness. Support for this idea comes from Timko and Janoff-Bulman (1985) who found behavioural self-blame to be associated with good adaptation up to two years after treatment for breast cancer.

These findings were supported and extended by Glinder and Compas (1999) who found characterological self-blame predicted psychological distress up to one year after the initial onset of breast cancer. They also found that independently, both characterological and behavioural self-blame were strongly correlated with symptoms of anxiety and depression. However, when simultaneously entered into regression analyses, behavioural self-blame was more likely to predict distress cross-sectionally, over different times, while characterological self-blame predicted distress prospectively. This finding, combined with that of Malcarne et al (1995) suggests characterological self-blame seems to have long-term psychological effects on adjustment, while behavioural self-blame is maladaptive at the moment. As in Malcarne et al (1995), Glinder and Compas (1999) explained this latter finding by stating that the beneficial effects of behavioural self-blame may not be seen until several years after the diagnosis of cancer.

Overall, these results support the maladaptive nature of characterological self-blame, suggesting that any poor self-blame/adjustment associations may be a reflection of this type of self-blame. However, inconsistent findings emerged about the adaptive nature of behavioural self-blame. Research in non-cancer samples contributes to this inconsistency by finding no beneficial effects of this up to one year after the onset of injury (Kiecolt-Glaser and Williams, 1987; Sholosmkas et al, 1990).

2.3.3.7 Conclusions: The Self-Blame/Adjustment Relationship

The contradictory findings of the benefits of behavioural self-blame attributions lead to the conclusion that distinguishing between types of self-blame reveals nothing about the self-blame/adjustment relationship. Houldin, Jacobsen and Lowery (1996) supported this with their finding of a poor self-blame/adjustment relationship in their breast cancer patients regardless of the type of self-blame measured. From this the authors stated that investigating two types of self-blame does not reveal anything more about the self-blame/adjustment relationship than using self-blame as a singular construct. Instead, they found differences in adjustment depending on the extent of self-blame attributed. Those breast cancer sufferers who attributed a high amount of blame for their cancer to themselves were more poorly psychosocially adjusted to their cancer than those who attributed a mild or moderate amount of blame. Some research has supported this finding (Kiecolt-Glaser and Williams, 1987; Nielson and MacDonald, 1988), although other studies have found high self-blame to be associated with better coping than low self-blame (Bulman and Wortman, 1977). Regardless of the direction, these results suggest it is the extent of self-blame attributed which may be important for adjustment to a pain/illness/injury situation, rather than types of self-blame (Houldin et al, 1996). Most of the reviewed studies used self-blame as a singular construct. Thus, the use of self-blame, combined with the variations in method across studies (see section 2.3.3.5) may help to explain the mixed self-blame/adjustment associations in the research reviewed.

2.3.3.8 The Other-Blame/Adjustment Relationship

Sholomskas et al (1990) found a lack of research replicating Bulman and Wortman's (1977) findings of a positive self-blame/adjustment association not only in pain/illness/injury samples, but also in variety of research domains. Indeed, of 23 studies they reviewed, only nine were found to replicate these findings. More consistent support has been found for a negative association between other-blame attributions and adjustment. Tennen and Affleck (1990) reviewed the other-blame literature and found 17 out of 25 studies they reviewed, in a variety of research domains, to support this association. A few studies in the present review found other-blame attributions to be unrelated to adjustment (Brewin, 1984; Heinemann et al, 1988). However most found them to be associated with poor adjustment to a pain/illness/injury situation (Bulman and Wortman, 1977; Delahanty et al, 1997; Rich et al, 1999; Sholomskas et al, 1990).

Specific types of other-blame attributions have been associated with poor adjustment. DeGood and Kiernan (1996) examined the nature of the other-blame/adjustment relationship in their sample of 188 mostly female chronic pain sufferers attending a pain management programme. The mean age of the sample was 46 years, and the most frequently reported pain duration was between 1-5 years. Blame was investigated through asking the pain sufferers who they thought was at fault for their pain: themselves, their employers, another person or no one. Adjustment was investigated using a measure of psychological distress. In addition, current and anticipated average pain and activity interference were measured using a Likert scale.

To summarise the main findings, around one-third of the sample blamed either their employer (n = 32), or another person (n = 41) for their pain problem. Only 11 participants rated themselves to be at fault. Most (n = 104) reported their pain to be no one's fault. Differences were found between those who attributed fault to their employer and those in the other pain groups. Specifically, those who blamed their employer anticipated higher pain levels and more limitations in activity at the end of treatment, than those who blamed another person or no one. They also reported greater psychological distress. Additionally, those who attributed fault at all reported greater psychological distress than those who did not ascribe fault. The authors concluded from these results that attributing fault to others for one's pain situation seems to be associated with responses to treatment.

Additionally, Church and Vincent (1996) investigated the blame attributions of chronic pain sufferers who had been injured as a result of a variety of medical accidents, and found blaming doctors to result in poor psychological adjustment to the chronic pain condition. They proposed various explanations for this poor association, including that after medical accidents just world beliefs may be challenged, shattering the belief that the world is an orderly place. This may lead to the belief that doctors are fallible, and increase feelings of being unprotected.

There are several explanations why blaming others leads to poor adjustment. Firstly, this could lead to feelings of anger and the need for revenge and justice. The result of this could be that an individual may not accept responsibility for his/her condition, leading to poor compliance with treatment, and ultimately poor adjustment to the condition (DeGood and Kiernan, 1996; Sensky, 1997; Sholomskas et al, 1990). Secondly, Tennen and Affleck (1990) suggested that blaming others may lead to poor adaptation because other people may not agree with this blaming, resulting in person becoming alienated from family and friends. This contrasts with the reported benefits of making self-blame attributions, including that self-blame allows an individual to maintain control over a negative situation and a belief in the world as a just place (see section 2.2.4.5).

2.3.4 Individual Differences in Attributions and Adjustment

Section 2.2.3.7 identified various factors that may influence the types of attributions made for pain/illness/injury, including education level (Pill and Stott, 1982). This was found in the research reviewed, where breast cancer sufferers with a high school education blamed themselves less for their cancer than those without (Houldin et al, 1996). This was interpreted in terms of the fact that the more educated participants may have been giving socially desirable responses and so blamed themselves less for their cancer. Other demographic influences on making self-blame attributions included marital status, where those who were never married reported higher levels of self-blame than those who were married (Houldin et al, 1996). Additionally, Heinemann et al (1988) identified age effects in the responsibility attributions made in their spinal injured patients. Specifically, those who were younger were more likely to attribute responsibility for their spinal injury to themselves, and to environmental factors than those who were older.

Age differences in adjustment outcomes have also been identified. Schulz and Decker (1985) found the younger spinal-injured patients in their study had higher levels of psychological well being than the older patients. Berckman and Austin (1993) found gender differences in the adjustment of their lung cancer patients, where males had poorer sexual and social relationships than females.

Various health, psychological and functioning outcomes have been found to interact with each other. These have generally involved psychological (emotional) outcomes interacting with the other outcomes. For example, depression and distress have been associated with self-reported pain severity (Church and Vincent, 1996), poor daily functioning and mobility (Brewin, 1984; Lowery et al, 1983), and changes in behaviour, specifically work (Brewin, 1984), and pain behaviour (Kiecolt-Glaser and Williams, 1987).

2.3.5 Criticisms of Research Investigating the Attribution/Adjustment Relationship

Two criticisms can be made of research investigating the attribution/adjustment relationship in pain/illness/injury samples. Firstly, the adjustment measures adopted in the studies can be criticised on three levels. Firstly, combinations of health, psychological and functioning measures often used across studies can be criticised on the basis that unrelated adjustment components have been found to be unreliable (Turnquist et al, 1988). Secondly, while all studies discussed the reliability and validity of their measures, few mentioned the suitability of their adjustment measures to be used with their samples. For example, Berckman and Austin (1993) and Taylor et al (1984) reported their adjustment measures to have been validated on similar samples to those in their studies, while Low et al (1993) acknowledged that their measure of coronary risk was not designed or validated for their sample of female heart attack sufferers. Thirdly, the use of structured questionnaires to measure adjustment limits what can be learned about adjustment to illness/injury in general, and pain in particular.

The second criticism refers to the largely correlational nature of the studies reviewed. No clear findings have been established about the causal direction of the attribution/adjustment relationship, making it impossible to determine how attributions may impact on adjustment. This has led to various ideas about how attributions and adjustment relate to each other. Firstly, Macleod (1999) proposed that rather than certain attributions leading to adjustment outcomes, adjustment outcomes such as psychological distress may actually lead to attributions being made. Secondly, adjustment has been viewed as a consequence of attributions. Thirdly, attributions have been described as mediating the impact of negative events on adjustment (Downey, Silver and Wortman, 1990), and fourthly, attributions and adjustment have been seen as reflective of the same underlying phenomenon, specifically depression (Meana et al, 1999).

2.3.6 Summary and Conclusions: The Attribution/Adjustment Relationship

In summary, the reviewed research produced mixed attribution/adjustment relationships across cause, responsibility and blame. Some attributions were found to be associated with good adjustment, while others were associated with poor adjustment to pain/illness/injury. Additionally, in some instances attributions were unrelated to adjustment. Variations were also found in terms of whether or not it is adaptive to make attributions at all. Some research indicated those who make attributions to be better adjusted to their situation than those who do not, while other research has found the opposite: those who do make attributions are more poorly adjusted to their situation than those who do not. Yet other research has suggested there are no differences in adjustment between those who make attributions and those who do not.

This suggests there is no straightforward answer concerning whether or not making attributions for pain/illness/injury helps an individual to adjust to this situation. Four variations in methods employed across studies may help account for the differences found. Firstly, different types of adjustment measures were employed across studies. Attributions may have been associated with some outcomes and not others. Secondly, there was some indication in the literature that the particular relationships attributions have with adjustment may be dependent upon the context in which they were made. The participants in each of the studies reviewed were suffering from specific conditions, and were largely recruited from specialised treatment centres. It may be that issues specific to each of these treatment contexts influenced the nature of the attribution/adjustment relationships found (see section 2.3.3.5).

This relates to the third methodological variation, in terms of the different samples employed. The attribution/adjustment relationship may be disease-specific in that attributions might help people adjust to some conditions but not others. This may help explain why in some instances attributions were unrelated to adjustment (see section 2.3.2.4). Fourthly, various times since diagnosis of a condition were adopted across studies. This meant that in some instances the attribution/adjustment relationship was investigated at the same time, around the time of diagnosis, while in other studies attributions were made for a condition several years after its initial onset, and investigated for their associations with current adjustment to the condition. It is likely this variation in timing contributed to the different attribution/adjustment relationships found across studies (see section 2.3.3.5). Consideration of these issues may reveal more about whether or not attributions are beneficial for adjustment to pain/illness/injury.

In addition to these variations, three other factors may have inadvertently influenced the nature of the attribution/adjustment associations found. Firstly, both overt and undetected factors may have mediated the relationship. The second point involves motives for making attributions. If these include the aim to develop an understanding of and gain control over a negative situation (see section 2.2.3.5), then they should be associated with good adjustment. The fact this was not always the case suggests that people may give attributions for other reasons, for example because something is medically known about the cause of the condition. Attributions made under these circumstances may have fewer implications for adjustment than attributions made in the absence of any knowledge about causes of the situation, because these latter attributions might have some personal meaning to an individual (see section 2.2.3.6).

Thirdly, most studies investigated the attribution/adjustment relationship without initially reporting adjustment levels. This should be considered in order to provide a baseline from which to determine the exact influence attributions have on adjustment levels. It is possible to score higher on some adjustment questionnaires than others (Turnquist et al, 1988), and this may lead to different attribution/adjustment results being produced. The few studies reporting adjustment scores alone produced mixed levels of adjustment. These included poor (Lowery et al, 1993), medium (Bulman and Wortman, 1977; Schulz and Decker, 1985; Sholomskas et al, 1990), and good levels of psychosocial adjustment to pain/illness/injury (Berckman and Austin, 1993; Houldin et al, 1996; Lavery and Clarke, 1996). Various attribution/adjustment relationships were found in these studies regardless of the extent of adjustment. This suggests that the extent of adjustment may not influence the relationship found.

Church and Vincent (1996) measured self-reported adjustment in their sample of chronic pain sufferers. They used an interview schedule to measure adjustment, and found their participants to report feeling numb, worried and shocked at the onset of their pain, due to the circumstances surrounding the pain onset. At the time of the interview a lot of anger, bitterness and sadness towards the situation was reported. This suggests a change in the emotions experienced towards the pain over time, supporting the point made in section 2.2.5.3, that adjustment may change over time (Turnquist et al, 1988).

2.4 OVERALL SUMMARY OF CHAPTER TWO

There were three sections to the second chapter. The first section overviewed the nature of pain. Gate Control Theory introduced the importance of investigating psychological factors in the experience of pain, by proposing that various psychological factors might influence the way in which the physiological pain experience is interpreted (see section 2.1.5.4). There are also many psychological consequences of pain (see section 2.1.7). In persistent pain, a combination of these factors, along with cognitive and behavioural components may lead to the development of a "chronic pain syndrome" (see section 2.1.7). The potential overall impact of pain can be understood when considering that up to half of a random community sample can experience persistent pain at any one time (see section 2.1.4). People may develop beliefs specific to their own pain. These beliefs will have repercussions for the pain experience. For example, beliefs about pain treatment may affect compliance with treatment (see section 2.1.7). This suggests that it is important to understand not only direct pain beliefs but also other beliefs individuals hold surrounding their pain, in order to gain knowledge of the possible influences of these beliefs on the pain experience.

Attributions and just world beliefs were discussed in the second section of the chapter. These beliefs also have repercussions for the pain experience and other negative personal situations, in terms of their associations with adjustment. However, four shortcomings of attribution literature should be addressed before their interactions with adjustment are investigated. Firstly, there is a lack of research empirically distinguishing between cause, responsibility and blame in real-life research. Secondly, perhaps because of the first point, all three concepts are often used interchangeably in research. Thirdly, structured responsibility and blame measures do not allow the extent and nature of any freely made attributions to be determined. Fourthly, there is a lack of research investigating whether or not all three concepts change over the pain/illness/injury experience. The implications of these shortcomings were covered in section 2.2.3.9, suggesting they should be addressed.

Similar to attributions, the just world literature is limited in that there is a scarcity of research investigating just world beliefs in pain sufferers. This is despite the fact that the impact of pain may challenge an individual's just world beliefs, and in turn affect adjustment to the pain (see section 2.2.4.7). This suggests that the role of just world beliefs in the experience of pain should be investigated.

There was some consistency in the finding that positive pain and just world beliefs are adaptive in the face of a negative personal situation. However, section three produced less consistent results in terms of whether or not cause, responsibility and blame attributions are beneficial for adjustment to pain/illness/injury. This inconsistency was attributed to four variations method in employed across studies, in terms of the various adjustment measures, contexts, samples and time frames adopted across studies (see section 2.3.6). Additionally, the criticisms of the research outlined in Section 2.3.5 may also have contributed to these mixed findings. It is important to consider these issues in order to determine with greater clarity whether attributions are beneficial for adjustment to pain.

CHAPTER 3: THE STUDY AIMS

3.1 INTRODUCTION

The aim of the study was to investigate the nature of and relationship between attributions, just world beliefs and adjustment to pain. Chapter 2 presented various methodological issues and shortcomings associated with these areas of the literature. This limits what can be learned about the role of these concepts in pain. The present study aimed to address the issues and limitations associated with attributions (Chapter 2, section 2.2.3.9), just world beliefs (Chapter 2, section 2.2.4.7), and adjustment (Chapter 2, sections 2.3.5 and 2.3.6) in two phases outlined in this chapter.

3.2 PILOT PHASE

The first phase developed and piloted a measure to address these limitations. Not all shortcomings of the attribution/adjustment relationship were considered in the present study. Those issues that were addressed, and the means by which the tool addressed these and the other issues will be considered in Chapter 4 (section 4.3.3).

3.3 MAIN STUDY PHASE

The piloted tool provided the measure to investigate the issues and shortcomings of the attribution, just world belief and adjustment literature in greater detail. This was achieved through a series of five aims in the main phase of the study, as follows.

3.3.1 Aim 1: Attributions

The first aim was to examine the cause, responsibility and blame attributions made for pain. There were four parts to this. The first three parts were concerned with the shortcomings of the attribution literature. Having taken these into account, the piloted measure was used to explore:

(a) Whether cause, responsibility and blame attributions were made for pain, and the nature of any attributions made

(b) Whether distinctions were made between cause, responsibility and blame attributions in pain

(c) Whether cause, responsibility and blame attributions changed for different times in the pain experience

The fourth part of the aim was concerned with motives for making causal attributions, involving both knowledge and uncertainty factors (Chapter 2, section 2.2.3.5), and were examined in the present study with the specific aim to explore:

(d) Motives for making causal attributions, involving knowledge factors and uncertainty

3.3.2 Aim 2: The Nature of Adjustment

The second aim was to use the piloted tool to explore various ways of adjusting to pain, using the following three outcomes:

(a) Health outcomes, involving pain management, including treatments received and self-management strategies

(b) Psychological outcomes (emotions). This included an exploration of whether adjustment to pain changed over the course of the pain experience

(c) Functioning outcomes (physical and social)

3.3.3 Aim 3: Interactions Between Attributions and Adjustment

The third aim was to investigate the nature of the relationship between cause, responsibility and blame attributions, and adjustment to pain. There were five parts to this. Each will be considered in turn.

Inconsistent findings have emerged concerning whether or not those who make causal attributions for their illness are better or more poorly adjusted to their illness than those who do not. Additionally, some research has suggested there are no differences in adjustment between both groups (Chapter 2, sections 2.3.2.2 and 2.3.2.3). To address this inconsistency, the first part of the aim was to determine:

(a) Whether there were any differences in adjustment to pain between those who made causal attributions for their pain and those who did not.

Chapter 2 (section 2.3.2) also identified a mixture of positive and negative relationships between causal attributions and health, psychological and functioning outcomes. The extent to which causal attributions were adaptive or resulted in poor adjustment to pain was investigated in the second part of the aim, to determine:

(b) The nature of the relationship between causal attributions made for, and adjustment to pain

Additionally, making responsibility and blame attributions to the self have been found to be both adaptive and maladaptive for adjustment to pain/illness/injury (Chapter 2, sections 2.3.3.2 - 2.3.3.4). The extent to which these attributions resulted in good or poor adjustment to pain was explored, the third part of the aim being to determine:

(c) Whether self-responsibility/blame attributions for pain were adaptive for adjustment to pain

More consistently, attributing responsibility and blame for one's pain/illness/injury to others has been associated with poor adjustment (Chapter 2, section 2.3.3.8). To investigate the extent to which this was the case in the current pain sample, the fourth part of the aim was to examine:

(d) Whether other-responsibility/blame attributions for pain resulted in poor adjustment to pain

The last part of the third aim involved the timing of the attribution/adjustment relationship. The literature in Chapter 2 (sections 2.3.2.4 and 2.3.3.5) suggested that there may be more of an attribution/adjustment relationship when both are investigated for the same time, than when attributions made for the onset of a situation that occurred years earlier are paired with current adjustment to the situation. This was explored in the present study using the piloted tool to determine:

(e) Whether the attribution/adjustment relationship varied for different times in the pain experience

3.3.4 Aim 4: The Belief in a Just World

Chapter 2 (section 2.2.4.7) highlighted the relevance of exploring the role of just world beliefs in the experience of pain. Having already considered this in the pilot study, this role was explored in greater detail in the main phase of the research. There were three parts to the fourth aim. The first two parts involved directly investigating the role of just world beliefs in pain, through:

(a) Determining the strength of the just world beliefs held by pain sufferers

(b) Examining differences in just world beliefs within pain-related variables. Specifically:

(1) Exploring differences in the just world beliefs of different types of pain groups

(2) Exploring differences in the just world beliefs of different pain duration groups

The third part examined the role of attributions in maintaining just world beliefs if threatened by the pain experience (Chapter 2, section 2.2.4.4). This involved:

(c) Considering the role of cause, responsibility and blame attributions in maintaining justice beliefs. Specifically:

(1) Determining whether there were differences in the just world beliefs of those who made causal attributions for their pain and those who did not

(2) Determining whether those who made responsibility and blame attributions to themselves for their pain had stronger just world beliefs, than those who made attributions to others

3.3.5 Aim 5: Differences in Adjustment Between Those With Differing Strengths of Just World Beliefs

Research has investigated associations between high just world beliefs and adjustment to short-term negative personal situations (Chapter 2, section 2.2.4.6), but not longer-term negative personal situations such as pain (Chapter 2, section 2.2.4.7). To address this shortcoming, the fifth aim was to determine:

- Whether there are any differences in adjustment to pain between those with high, medium and low just world beliefs

The development of the piloted tool that created the basis for these aims to be examined, is detailed in Chapter 4.

CHAPTER 4: THE STUDY METHOD

4.1 INTRODUCTION

This chapter will detail the method employed in the present study. The following will be considered. Firstly, design issues, specifically the nature of the study, types of measures used, and details of the sample, in terms of the type, pain duration, age of the sample, and methods of recruitment. Secondly, the measures employed in the study. Thirdly, the pilot study of the interview schedule. Fourthly, the qualitative and quantitative analysis of the data, and summary of the analysis of the study aims. Fifthly, the method employed in the main phase of the study. The final section will summarise the chapter.

4.2 STUDY DESIGN

4.2.1 Design

4.2.1.1 The Exploratory Nature of the Present Study

Chapter 3 (section 3.1) stated the aim of the present study was to investigate the nature of and relationship between attributions, just world beliefs and adjustment in pain. To achieve this, methodological issues and shortcomings of research examining these concepts in pain/illness/injury were taken into account (Chapter 3, section 3.2). This made the present study an exploratory investigation, because attributions and adjustment have not been investigated in this way before in relation to pain, and just world beliefs have not been measured before in relation to pain perception.

4.2.1.2 The Measures Employed in the Present Study

In order to examine these issues, specific questions needed to be asked of the pain sufferers, making an interview schedule the most appropriate tool. An unstructured interview schedule was inappropriate to use because it has no set questions. Instead, the researcher has general topics he/she wishes to discuss, and lets the conversation develop in this area (Robson, 2002). A structured interview schedule was also inappropriate because although it contains specific questions, it also contains specific response categories from which participants must select an answer (Robson, 2002). This was inappropriate because in order to explore methodological issues and shortcomings there was a need to obtain participants' own responses to set questions. A semi-structured interview format was the most suitable measure because it involves the creation of specific questions without limiting responses that can be given (Robson, 2002). These questions also contain a degree of flexibility, in that for example questions can be excluded or included based on what seems appropriate with a particular individual (Robson, 2002).

There are several advantages and disadvantages of using interviews. Disadvantages include that they are time-consuming both to make arrangements for, and to conduct. The lack of standardisation also raises concern about reliability (Robson, 2002). However, as was intended in the present study, interviews can be used in the initial stages of research to identify areas of further exploration (Breakwell, 2000). Other advantages include that they are a flexible and easy way of finding things out, and they allow any interesting responses to be followed-up. This made an interview the most appropriate measure to use in the current study.

There were two phases to the present study, a brief pilot phase, and a main study phase. The usefulness of a developed semi-structured interview was tested in the pilot phase of the study. A revised version of the schedule was then used in the main phase to investigate the aims outlined in Chapter 3 (section 3.3). Two other measures, a standardised pain questionnaire, and non-standardised just world questionnaire were also used in both the pilot and main phase to measure pain and just world beliefs in the sample. In the same way that the development of the interview schedule was based on the literature reviewed in Chapter 2, the use of both questionnaires was dependent upon the reliability and validity of the measures discussed in Chapter 2. All measures will be described in section 4.3. The data was analysed using a mixture of qualitative and quantitative techniques (see section 4.5.4 for a discussion of the way in which the data was analysed).

4.2.2 The Sample

4.2.2.1 Sample Type

In Chapter 2 (section 2.3.6) it was suggested one reason for the mixed attribution/adjustment associations found in the literature is that this relationship is disease-specific. This limits the ability to generalise results across samples. In order to avoid such restrictions and consider the exploratory results in terms of the wider pain community, pain sufferers with mixed pain complaints were recruited. Additionally, Chapter 2 (section 2.3.2.3) indicated that attributions might not only be important for adjustment in chronically ill samples, but may also help recovery from acute illness conditions. This being the case, no limit was placed on pain duration in the sample.

4.2.2.2 Pain Duration Criteria

Chapter 2 (section 2.1.2) outlined various pain duration criteria that have been used to distinguish between acute and chronic pain. A commonly used criterion suggests pain becomes chronic after three months (IASP, 1986). This criterion was adopted in the present study.

4.2.2.3 Age

The only age limitation of the study was that the pain sufferers were adults (i.e. aged 18 years or over). This covered the age ranges of the samples studied in Chapter 2 (section 2.3). However, in these studies the conditions experienced were age-related. For example, the myocardial infarction, cancer and rheumatoid arthritis sufferers tended to be older, with a mean age of around 50 years. Conversely, those involved in various accidents tended to be younger, with a mean age of around 30 years. One advantage of using a sample of people with mixed pain complaints is that it may lead to a sample of pain sufferers of various ages, rather than focussing on specific pain conditions that may be age-related.

4.2.2.4 Sample Recruitment

In order to address the selection bias of many studies involving pain/illness/injury samples recruited from specialised treatment centres (Chapter 2, section 2.3.3.5), the sample in the present study was recruited from the community in the central belt of Scotland. The Research Ethics Committee of the local Health Board granted approval for the study to be conducted in this area.

4.2.2.5 Methods of Recruitment

Three recruitment methods were used to obtain a community sample. Two involved advertising the study. In the first method a poster was developed detailing the general nature of the study, the volunteers required, what participation in the study would involve, how long it would last, and providing information on the contact details of the researcher (see Appendix 1 for the poster). It was planned that the posters would be displayed in three main areas. Firstly, in a local General Practice. Managers of General Practices in the study area were contacted by letter requesting that posters be displayed in their surgery waiting rooms. This resulted in a low response rate. However, with some follow-up telephone calls the response rate increased, and posters were subsequently sent to those General Practices who granted permission for the posters to be displayed. Secondly, it was planned that the poster be displayed in a local shop. Subsequently, permission was granted by the owner of the shop for a poster to be displayed. Thirdly, some posters were displayed around the University from where the study was to be conducted.

The second method of recruitment planned involved the media. A meeting was initially held with the Public Relations Officer of the University where the study was based, to discuss the content of the media advertisement. This was similar to the content of the poster. The outcome of this meeting was the study being advertised on the local radio and in local newspapers.

Both recruitment methods led to a convenience sample being obtained. Disadvantages of using convenience samples include that it is not known whether or not the findings obtained using this sample are representative. However, convenience samples can be used to get a feel for issues involved in a particular research area (Robson, 2002). This made a convenience sample appropriate to use in the present exploratory investigation.

For the third recruitment method, the Practice Manager of the medical centre in the grounds of the university where the study was based was contacted, and permission sought for the researcher to attend the medical practice and approach pain sufferers to request their voluntary participation in the study. Permission was granted to do this, and so the researcher made infrequent visits to the medical centre throughout the period of recruitment.

4.3 STUDY INSTRUMENTS

4.3.1 The Short-Form McGill Pain Questionnaire

Gate Control Theory (Chapter 2, section 2.1.5.4) viewed pain as a multidimensional experience involving both sensory and affective components. This being the case, a pain measure incorporating these components was selected for the present study. The McGill Pain Questionnaire (MPQ) (Melzack, 1975) incorporates both factors, and has demonstrated reliability and validity in a variety of acute and chronic pain samples (see Melzack and Katz, 2001 for a review of this literature). However, this was not used in the present study due to the length of time it takes to complete (5-10 minutes) (Melzack, 1987). This duration was considered too long because pain was investigated for three different times: currently, on a usual day, and when at its worst. A shorter version of the MPQ, the short-form McGill Pain Questionnaire (SF-MPQ) (Melzack, 1987) can be completed within 2-5 minutes, and thus was used in the study. Chapter 2 (section 2.1.6.3) discussed other advantages of the SF-MPQ, one of which is that it has been used to measure both acute and chronic pain. This is of particular relevance to the present study, given that pain was measured in a variety of acute and chronic pain conditions. Additionally, the SF-MPQ has been found to be useable with different age groups. This is an advantage because apart from the requirement that all participants must be of adult age, no age limitations were placed on the sample in the present study (see Appendix 2.1 for the SF-MPQ).

Chapter 2 (section 2.1.6.3) provided a description of the SF-MPQ along with details on how it should be scored. The SF-MPQ was used in this way in the present study, except for the visual analogue scale (VAS), which was not used. Instead, a pain gauge was employed where participants are required to move the gauge on a slope rising in intensity from "no pain" at the bottom of the slope, to "worst pain ever" at the top of the slope, to indicate their pain level. The other side of the gauge contains a scale ranging from 0-100, to accurately record the reported pain intensity. This was favoured over the VAS because it gives participants a physical indicator of pain, and allows precise pain scores to be obtained. A score out of 100 was obtained on this scale, and divided by 10 to convert it to a score consistent with the VAS.

4.3.2 The Rubin and Peplau (1975) Just World Scale

Taking into account the shortcomings of just world research (Chapter 2, section 2.2.4.7), the interview schedule contained questions measuring just world beliefs in relation to individual pain situations (see section 4.3.3.6, to be discussed). Additionally, general just world beliefs were measured using the Rubin and Peplau (1973; 1975) Just World Scale (Chapter 2, section 2.2.4.5). Although the scale has been criticised on several levels, the advantages of the scale made it appropriate to use in the present study. In addition to this, although the scale has not been used in pain patients before, it has been used in related, injured samples (Bulman and Wortman, 1977; Heinemann et al, 1988; Kiecolt-Glaser and Williams, 1987). In the present study the Rubin and Peplau (1975) scale was completed and scored in the way outlined in Chapter 2 (section 2.2.4.5), with one exception. That is, given the scale is American, any reference to "America" in the scale items was changed to "British" (see Appendix 2.2 for the Just World Scale).

4.3.3 The Interview Schedule

4.3.3.1 Introduction

Section 4.2.1.2 justified the use of a semi-structured interview schedule to address the methodological issues and shortcomings of the literature. This section will outline the development of the schedule; in relation to firstly, the nature of the interview questions, secondly, the question topics, thirdly, the questions in each topic, and fourthly, the way in which the interview schedule was coded.

4.3.3.2 The Nature of the Interview Questions

The semi-structured interview schedule took the form of a series of direct questions in order to reduce the amount of irrelevant information obtained. The development of the pilot questions included a pre-pilot phase where some initial questions were informally discussed with pain sufferers known to the researcher. The aim of the interview questions was to explore participants' beliefs, feelings and knowledge about their pain. Additionally, a series of possible probing questions were included in anticipation of responses that required greater clarity. Two time frames were included: the pain onset (retrospectively), and the pain now (i.e. at the time of the interview).

The questions were ordered in such a way so as to allow the interview to progress naturally. Demographic questions opened the interview, as a means of warming each participant to it. These were followed by questions aiming to focus the participants on their pain, the subject of the interview. This took the form of questions concerning the perceived avoidability of the pain in the first place (a possible factor influencing the making of responsibility and blame attributions). Having firmly established the subject matter, questions pertaining to the main body of the interview, the consequences of the pain were introduced. These began with specific beliefs in relation to pain, namely just world beliefs and attributions, then adjustment to the pain. This included questions investigating participants' feelings about their pain. To begin drawing the interview to a close questions about knowledge and uncertainties about pain (factors influencing the making of causal attributions) were asked. The interview closed with questions investigating each participants' expectation of pain duration, feelings towards this, and a question which allowed each participant to provide any additional information of their own about their pain.

4.3.3.3 Question Topics

The questions in the interview schedule were grouped into six topics, as follows:

Topic A: Demographic information

Topic B: Factors influencing the making of responsibility and blame attributions

Topic C: Justice beliefs

Topic D: Attributions

Topic E: Adjustment

Topic F: Factors influencing the making of causal attributions

The questions were presented in the order of the six topics above, with a few exceptions. These will be discussed where they occur in the justification of the questions within each topic. Each question number corresponded to the order in which it was presented in the interview schedule. In the following discussion of each topic, probing questions will be presented in brackets.

4.3.3.4 Topic A: Demographic Information

The interview schedule was phrased to gather information on each participant's age, gender, marital status, number of children, employment status, religion, type of pain, and duration of pain.

4.3.3.5 Topic B: Factors Influencing the Making of Responsibility and Blame Attributions

To address factors influencing the making of responsibility and blame attributions, the following questions were presented:

3 Do you think the level of your pain is to be expected, considering how it started in the first place?

4 When your pain first began, were you doing something that you would normally do at that time? (If not, what were you doing? How do you feel about this?)

5 Were you in a place that you would normally be in at that time? (If not, where were you?)

7 In general, do you think the onset of your pain could have been avoided? (How do you feel about this?)

Questions three, four, five and seven investigated possible factors influencing whether or not the pain situation was perceived as avoidable in the first place. Justification for this comes from some blame literature, specifically Bulman and Wortman (1977) who found that what an individual was doing at the time of the onset of a spinal injury will influence whether or not the person perceives he/she could have avoided the injury onset. Perceived avoidability was investigated in this pain sample for two reasons. Firstly, because these judgements might influence whether or not people attribute responsibility or blame for their pain to themselves. Secondly, it can directly affect adjustment (Bulman and Wortman, 1977) and thirdly, it can mediate the attribution/adjustment relationship (Bulman and Wortman, 1977).

4.3.3.6 Topic C: Justice Beliefs

The following questions were related to justice beliefs:

6 Do you believe that the fact you have pain is, "just one of those things?" or do you think it is unfair? (If unfair, how do you feel about this?)

34 Do you know other people who are experiencing pain similar to your own? (Who?)

35 (If so), how well do you think you manage your pain, in comparison to those who have a similar pain to you?

36 Are you able to put your pain into perspective (by saying e.g. that there are people worse-off than you?)

37 Where does your pain feature in your life, in comparison to your other life experiences? (i.e. is it nothing in comparison to something else?)

There has been a lack of research investigating the just world beliefs of pain sufferers. The relevance of measuring these beliefs in pain was considered in Chapter 2 (section

2.2.4.7). Introducing justice beliefs into pain, question six explored whether or not each participant thought it was fair that he/she should suffer pain. This was included with questions concerning the pain onset so that the participants would consider the fairness of their pain in light of its onset (see Appendix 3 for the full pilot interview schedule). Questions 34, 35, 36 and 37 were concerned with comparison, both in ones' own life (question 37), and with others suffering pain (questions 34,35 and 36). They were separated from the question about fairness of the pain because they were presented in the context of other questions investigating social circumstances surrounding the pain. These questions were included because in addition to attributions, they represent one way of maintaining just world beliefs, and apply to various forms of victimisation, including illness, an area related to pain (Chapter 2, section 2.2.4.4).

4.3.3.7 Topic D: Attributions

Questions measuring cause, responsibility and blame for pain were developed in a way which would take into account existing methodological shortcomings of this research in pain/illness/injury samples (Chapter 2, section 2.2.3.9). There was also a theoretical basis to the attribution questions. These will be discussed in individual cause, responsibility and blame sections. However, two general points concerning the shortcomings are worthy of mention here. Firstly, in an attempt to limit the interchangeable use of the concepts, definitions of cause, responsibility and blame were developed. These were developed because few studies have been found to define attributions to their participants, and so definitions could not be adopted from existing literature. The definitions devised were based on theoretical backgrounds. However, they were not based on Shaver's (1985) Theory of Blame Assignment, because the theory requires that an individual must have intentionally produced a negative outcome in order for blame to be assigned, and definitions strictly incorporating this may confuse participants where this does not apply. Instead, the definitions were based on a devised tree analogy, and were drawn from the theoretical backgrounds discussed in Chapter 2 (section 2.2.3.2). Given the lack of previous research defining attributions, the definitions in the present study were exploratory. Secondly, the present study aimed to expand the limited available literature on whether or not attributions change over time (Chapter 2, section 2.2.3.8). However, this was not achieved through either longitudinal or cross-sectional investigations. Given time constraints it was not possible to do justice to a longitudinal analysis, and cross-sectional investigations would not permit changes in an individual's attributions over time to be established. Instead, attributions were examined *for* two different times, the pain onset (retrospectively), and now (i.e. current pain attributions).

One third point, not concerned with methodological shortcomings but relevant across all attribution types, is that before cause, responsibility and blame questions were presented, a note was made to establish whether or not each participant had previously ever considered each type of attribution in relation to his/her pain. The justification for asking this comes from Gudmunsdottir et al (2001), who reported that if a person had not previously considered attributions, then any subsequent attributions made may be unlikely to influence adjustment to the negative situation. Each type of attribution will be considered in turn.

A causal attribution was defined as follows:

"A cause can be defined as something which brings about a change e.g. a branch falling from a tree and hitting a person on the head. The falling of the branch is the cause, and the resulting headache is the change. This is an example of an impersonal cause, since no one was involved. A personal cause would be where e.g. someone threw a branch and it hit someone on the head. Whether it was intentional or not, the person is still the cause of the headache."

This definition of a cause was taken from Chapter 2 (section 2.2.3.2). The tree analogy was based around Heider's (1958) theoretical ideas of personal and environmental causality. The following causal attribution questions were presented:

8 What, if anything, do you yourself believe caused your pain to begin in the first place? (Why do you think this? Is there more than one cause? Did anyone cause the pain to happen? If so, why do you think this? Do you believe their actions were intentional? Do you believe they intended the outcome to happen? How do you feel about this?)

9 What, if anything, do you believe causes your pain now? (Is anyone the cause of this? Do you believe they acted intentionally? Do you believe they intended the outcome to happen? How do you feel about this?)

Question eight examined causal attributions for the pain onset, and question nine examined attributions for the pain now. Both adopted an open-ended format. This format is common among causal attribution measures (Chapter 2, section 2.2.3.5).

Three questions related to causal attributions were presented. One was presented at the beginning of the interview schedule, and questioned:
2 How did your pain start in the first place?

Two other questions were presented after the causal attribution questions, in order to distinguish them from causal attributions. These were concerned with triggers at the pain onset and now, as follows:
10 What factors triggered your pain at the start (not caused, i.e. what factors brought on a pain episode?)
11 What factors trigger your pain now?

Responsibility was defined as follows:
"To be held responsible for something involves being held accountable for something, although not necessarily to blame. In the branch example, the person would be held directly responsible because he/she actually threw the branch, but may not be to blame, because the injured person may have stepped into the path of the branch, which was supposed to hit a tin can on a wall. A person would be indirectly responsible if he/she didn't actually throw the branch, but e.g. was the parent of a child who threw the branch, and was responsible for the child."

The idea of being held accountable for something came from Fincham and Jaspars (1980), while direct and indirect responsibility was drawn from the first two of Heider's (1958) five responsibility levels: association (indirect), and causal responsibility (direct) (Chapter 2, section 2.2.3.2). The following responsibility questions were asked:

12 Do you yourself believe that you or anyone else was directly or indirectly responsible for the onset of your pain in the first place? (If so, who? Why do you believe this? How do you feel about this?)

13 Do you believe that this person/these people foresaw the consequences, or could have foreseen the consequences of their actions which led to your pain?

14 Do you believe that he/she/they acted intentionally? Do you believe they intended the outcome to happen?

15 Do you think that the behaviour that he/she/they carried out, which led to the onset of your pain was acceptable, considering the situation at the time?

16 Do you believe that you or anyone else is directly or indirectly responsible for you still having your pain now? (Is it the same person/people? If not, who is it? How do you feel about this?

17 (If different), Why do you think this person/these people are responsible for your pain now?

18 (Do you believe they acted intentionally? Do you believe they intended the outcome to happen? (i.e. for you to still be in pain). How do you feel about this? Do you believe that they were able to foresee the consequences of their behaviour, which led to you still being in pain? Do you believe that their actions were acceptable?)

The semi-structured nature of questions 12, 16 and 17 measuring responsibility attributions for the pain onset and pain now, took account of the structured nature of existing responsibility measures (Chapter 2, section 2.2.3.5). They were worded in such a way so as to allow participants to give their own responsibility attributions, within the bounds of Shaver's (1985) theoretical notion that responsibility must only be assigned to a person. Thus, attributions could be made to anyone at all, or no one at all.

Questions 13,14,15 and 18 investigated the extent to which Heider's (1958) responsibility levels foreseeability, intentionality and justifiability applied to responsibility attributed for the pain onset. In question 18 these levels served as probes because it was not known whether they would apply to the pain now. This is because their use in the present study was exploratory, given the lack of research making use of these levels in general (Chapter 2, section 2.2.3.2).

Blame was defined as follows:

"To blame someone for something involves finding fault with someone for the occurrence of a negative event. In the branch example, the person throwing the branch would be perceived to be directly to blame for the resulting injury, if e.g. he/she intentionally threw the branch at the other person, with the aim of hitting the other person. A person would be perceived as being indirectly to blame if e.g. he/she encouraged someone to throw the branch at the other person."

Blame was defined as in Chapter 2, section 2.2.3.2. The direct and indirect blame distinctions were used to be consistent with direct/indirect types of responsibility. Additionally, intentionality was introduced to be consistent with Shaver's (1985) theoretical idea that the intention to create harm must be present in order for blame to be assigned to a person (Chapter 2, section 2.2.3.3). The following blame questions were asked:

19 Do you yourself believe that you or anyone else was directly or indirectly to blame for the onset of your pain in the first place? (If so, who? Why do you think this? How do you feel about this?)

20 What is it about the person that you blame e.g. their character (i.e. them as a person), or their behaviour?

21 Do you believe that you or anyone else is directly or indirectly to blame for you still having your pain now? (If so, who? How do you feel about this?)

22 What is it about the person that you blame, e.g. their character (i.e. them as a person), or their behaviour?

Questions 19 and 21 allowed for blame to be attributed to anyone or no one at all for the pain onset and now. This took account of the same limitations as the responsibility literature, and included Shaver's (1985) theoretical idea that blame must be assigned to a person. Questions 20 and 22 explored the applicability of Janoff-Bulman's (1979) distinctions between behavioural and characterological self-blame in pain samples (Chapter 2, section 2.2.3.2). This was exploratory because types of self-blame have not been found to be examined before in pain samples, although they have been used in related, cancer and burns patients (Chapter 2, section 2.2.3.2).

Causal attributions have not only been distinguished from responsibility and blame attributions (Shaver, 1985), but also from reason attributions (Buss, 1978). This being the case reasons for pain were explored in an attempt to support this distinction. Using the same tree analogy applied to cause, responsibility and blame, a reason was defined as follows:

"A reason can be defined as a goal or purpose of something. In the branch example, a reason may have been that the person threw the branch with the purpose of hitting the other person in an act of revenge".

This was based on Buss's (1978) definition of a reason (Chapter 2, section 2.2.3.3). As with the other attribution types, any previous consideration of a reason was investigated before the participants were asked:

23 Do you yourself believe that there is a reason why you have your pain? (What is it/are they? Does your pain have any meaning to you?)

4.3.3.8 Topic E: Adjustment

Chapter 2 (section 2.3.5) outlined criticisms of research investigating the attribution/adjustment relationship in pain/illness/injury samples, including the nature of the adjustment measures. One criticism of them is that they are often in a structured questionnaire format, which limits what can be learned about adjustment to illness/injury situations in general, and pain in particular. In order to learn more about the adjustment to pain, the present study aimed to examine adjustment to pain in a semi-structured way using questions to guide topic areas, but not imposing response categories on participants. To develop adjustment outcomes relevant to pain, questions were presented that would allow the participants to define their own adjustment to pain using the health, psychological and functioning outcomes outlined in Chapter 2 (section 2.2.5.2). This was exploratory because no research has been found to allow pain sufferers to define their own adjustment to pain. Although the use of multiple adjustment measures has been criticised for being unreliable (Michela and Wood, 1986), the purpose of the present study was to investigate adjustment to pain in different areas of a person's life.

Chapter 2 (section 2.3.6) reported that variations in the timing of the attribution/adjustment relationship employed across studies investigating this association might contribute to the mixed results found. In order to consider this, to determine whether attributions and adjustment are associated at some times in the pain experience more than others, the interview schedule contained questions measuring attributions and adjustment for different times in the pain experience. Questions measuring adjustment for the pain onset and now were developed using the same criteria as that for measuring attributions for these times (see section 4.3.3.7). Adjustment for different times was examined in relation to psychological outcomes, namely emotional adjustment. Emotions towards the pain were selected as the psychological outcome in the present study because they are commonly measured in pain/illness/injury samples (Chapter 2, section 2.2.5.2). They were investigated for different times because some research has indicated they may change across the pain experience (Church and Vincent, 1996) (Chapter 2, section 2.3.6). The investigation of adjustment over time was exploratory because few studies have been found to investigate adjustment to pain/illness/injury for more than one time period. The following emotion questions were asked:

24 What, if any emotions did you have towards your pain when it first began?

25 What, if any emotions do you feel towards your pain now?

26 In general, would you say that since the onset of your pain, you have experienced more positive or more negative emotions? (What are they? Are you still experiencing them?)

The following questions were concerned with health outcomes:

27 What treatments have you had for your pain, throughout the course of your pain?

28 Do you yourself manage your pain in any way, over and above taking medication? (Do you feel like this gives you control of your pain?)

29 How do others manage your pain now e.g. doctors? (How effective do you find this?)

30 Do you believe that your pain can be controlled? (How does this make you feel?)

Questions 27 - 30 were centred on ways in which the participants' pain had been managed. This was examined because pain management is a common health outcome (Chapter 2, section 2.2.5.2). Question 27 explored in general various treatments for pain received, while question 29 investigated how others manage the pain. Question 28 examined whether the participants did anything themselves to manage their own pain. Question 30 was included to explore the extent to which the participants felt their pain could be controlled.

Both social and physical functioning outcomes have been commonly measured in pain/illness/injury samples (Chapter, 2, section 2.2.5.2), and so were explored in the present study through the following questions:

31 Has your pain limited what you are able to do on a daily basis? (In what way?)

32 Have you had to adapt your life in any way because of your pain?

33 How well do you feel that you have adapted to your pain?

38 Have you received any help and/or support since the onset of your pain? (If so, from whom?)

39 How helpful have you found this support?

Question 31 investigated any physical limitations on daily life imposed by the pain experience, while questions 32 and 33 examined any ways the participants had to adapt to the pain (both physically and socially), and feelings about this. Questions 38 and 39 explored social support as a form of social adjustment with the pain.

4.3.3.9 Topic F: Factors Influencing the Making of Causal Attributions

The following questions measured factors that might influence the causal attributions made for pain:

40 In general, do you feel you know a lot about your pain condition?

41 Are you satisfied with the information you have about your condition?

42 At present, are you uncertain about anything relating to your pain?

Chapter 2 (section 2.2.3.5) identified motives for making causal attributions, including both knowledge and uncertainty factors. Questions 40 and 41 were concerned with what the participants knew about their pain, and if they were satisfied with this knowledge. Question 42 measured any uncertainties related to the pain. These questions were included as possible reasons behind any causal attributions made for pain.

4.3.3.10 Miscellaneous Questions

Two other questions, not specific to any of the six topics were asked:

43 How long do you expect to experience your pain? (How do you feel about this?)

44 Would you like to tell me anything else about your pain?

Question 43 aimed to establish the extent to which each participant had a realistic view of his/her pain situation (e.g. after several years of pain did they still expect their pain situation to resolve?). Question 44 allowed the participants to add anything else about their pain. This interview schedule is reproduced in full in Appendix 3.1.

4.4 PILOT STUDY

The interview schedule was initially piloted on a sample of 12 community pain sufferers recruited using the poster advertisement (see Appendix 1). The results of the interview schedule and other, completed questionnaire data are presented as frequencies and means in Appendix 3.2. The outcome of the pilot study was that some improvements and amendments were made to the interview schedule. These can be seen in Appendix 3.3. The revised interview schedule used in the main phase of the study can be seen in Appendix 3.4.

4.5 DATA ANALYSIS

4.5.1 Introduction

This section will consider the way in which the interview and questionnaire data in the main phase of the study was analysed, in the following sections. Firstly, the qualitative data analysis of the interview data, considering the way the interview data was transcribed, alternative ways of analysing qualitative information, and thematic content analysis. Secondly, the quantitative analysis of the interview and questionnaire data, including the database created, management of missing data, statistical tests performed on the data and interpreting the data, and thirdly, the data analysis of the study aims.

4.5.2 Qualitative Data Analysis

4.5.2.1 Transcribing the Interview Data

All interviews were tape-recorded with permission from each participant. These tape recordings were then transcribed. Acknowledged disadvantages of transcribing interviews are that firstly, since the written and spoken word differ from each other, the written dialogue may seem disorganised (Powney and Watts, 1987). Secondly, a lack of clarity in listening to a recorded conversation may result in some spoken words being missed (Powney and Watts, 1987), and thirdly, facial expressions may also be missed. However, in order to gain as much as possible from the data, and to recreate the interview scenario as far as possible, the following transcribing style was adopted. Capital letters, full-stops, quotations marks, commas, pauses, mistakes, repetitions, and slang were all used to represent the flow of the conversation (Krippendorff, 1980), although for ethical reasons the names of specific people were excluded.

4.5.2.2 Methods of Analysing Interview Data

Once transcribed, interviews can be analysed in different ways. Analysis involves creating codes to identify patterns in the data. Various ways of coding interview data exist. For example, attributions can be coded using an attributional coding scheme (Stratton, 1991; 1997; Stratton, Heard, Hanks, Munton, Brewin and Davidson, 1986). This involves coding attribution responses in a series of eight stages, including the following dimensions: stable/unstable; global/specific and controllable/uncontrollable. These dimensions were originally developed by Weiner, Frieze, Kulka, Reed, Rest and Rosenbaum (1971). They refer to the extent to which attributions are likely to change, whether they are likely to affect a person's whole life, or specific parts of it, and whether they are controllable or not. Other research investigating attributions in chronically ill samples has coded data into these dimensions (Lowery et al, 1983; 1987). One advantage of this is that it provides consistent guides under which to analyse responses (Stratton et al, 1986), rather than researchers imposing their own categories on participant responses, which may result in different researchers coding similar responses under different categories. However, attributional dimensions were not used in the present study for two reasons. Firstly, only causal attributions not responsibility and blame attributions have been coded into these dimensions, and a consistent scheme was planned for all three concepts. Secondly, it was anticipated that the precise nature of the original attribution responses could be obtained using categories created from them, not by imposing categories on them.

In order to allow categories to emerge from the interview data, it was subjected to a qualitative data analysis. This allows both for the analysis of interview data in a purely qualitative way (e.g. Dey, 1993; Miles and Huberman, 1994; Riley, 1990), and for the quantification of this data, such as in thematic content analysis (Boyatzis, 1998; Carney, 1972; Holsti, 1969; Krippendorff, 1980). This latter method of analysis was selected because an aim of the present study was to conduct a thematic qualitative analysis of the responses to the interview questions, particularly attributions (see section 4.5.2.3), and a quantitative analysis of all the interview data (see section 4.5.3).

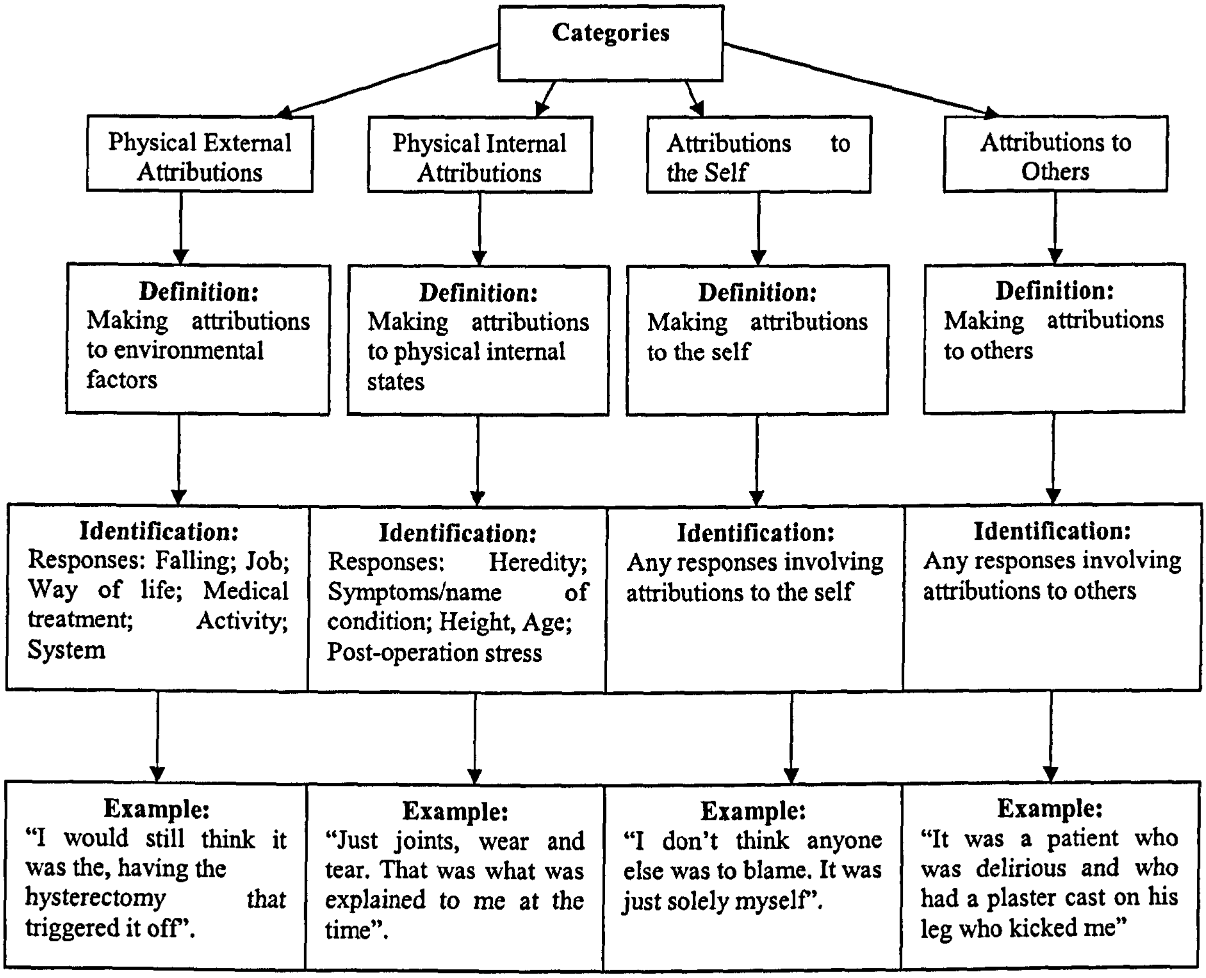
4.5.2.3 Thematic Content Analysis

Content analysis has been defined as, "a rigorous method of analysing text generated from interview transcripts" (Burnard, 1994, p.33). The aim of content analysis in examining text from interview transcripts is to illustrate, through the use of categories and subcategories, the issues discussed by interviewees during their interview. Most content analysis occurs at this level, identifying either data-driven or theoretically driven key themes, and patterns of responses (Carney, 1972). In the present study a hybrid approach to thematic analysis was used to analyse responses to the interview questions, because although the themes developed in the analysis were data-driven, they were not compared across samples. It has been suggested that a hybrid approach requires previous research/theories to articulate meaningful themes (Boyatzis, 1998). However, given that the interview questions in the present study were exploratory because they measured attributions and adjustment in a novel way, themes emerging from their responses could only be analysed on their own merit, rather than on the basis of previous research or theories. However, this did aid the interpretation of the emergent themes.

There are three main stages to conducting a data-driven thematic analysis (Boyatzis, 1998). Firstly, sampling and design issues must be considered. In this study a convenience sample of community pain sufferers was selected. Although there are problems both with convenience sampling (see section 4.2.2.5), and with generalising from non-specific community samples, this was adequate for the exploratory purposes of the present study. The second stage involves developing themes and a code. However, in order to do this, the way the data is analysed must first be identified. In this study the unit of analysis was each pain sufferer, and the unit of coding was their interview schedules, in particular responses to each of the questions of the schedule, represented as sentences. There are several stages to developing themes and a code. Firstly, the raw information must be reduced. In the present study the raw information was the responses to each question. For example, the question, "Who or what, if anything, do you yourself believe caused your pain to begin in the first place?", elicited the following response: "The back, overstretching. It clicked... I stretched too far" (16). This and all responses to the questions were gathered in notation form to determine any themes among them.

Secondly, from this raw information thematic categories emerge, and a code developed to clearly identify each theme. In the present study, across responses to each of the cause, responsibility and blame questions, for both time periods, four main and four scarcely mentioned categories emerged. These latter categories involved attributions to "Psychological Factors" (for example stress), "God", "Something" (an object), and "Don't know" (of an attribution). Given their scarcity these categories will not be discussed. The main categories involved "Physical External Attributions", "Physical Internal Attributions", "Attributions to the Self", and "Attributions to Others". Diagram 4.1 summarises these categories and the codes used to define them, in terms of definitions, statements of how they should be identified from the interview data, and an example of each category. The precise nature of the categories will be considered in detail in Chapter 5.

Diagram 4.1: Coding attribution categories



Categories	Physical External Attributions	Physical Internal Attributions	Attributions to the Self	Attributions to Others
Definition:	Making attributions to environmental factors	Making attributions to physical internal states	Making attributions to the self	Making attributions to others
Identification:	Responses: Falling; Job; Way of life; Medical treatment; Activity; System	Responses: Heredity; Symptoms/name of condition; Height, Age; Post-operation stress	Any responses involving attributions to the self	Any responses involving attributions to others
Example:	"I would still think it was the, having the hysterectomy that triggered it off".	"Just joints, wear and tear. That was what was explained to me at the time".	"I don't think anyone else was to blame. It was just solely myself".	"It was a patient who was delirious and who had a plaster cast on his leg who kicked me"

The final stage of developing themes and a code involves assessing each code for reliability, in order to account for researcher bias, and to help determine that the data coding is representative of the actual raw data (Boyatzis, 1998). Several different tests of reliability for interview data have been identified (Boyatzis, 1998; Krippendorff, 1980). The method used to analyse the reliability of the interview coding was inter-rater reliability. This refers to the extent to which a process can be recreated at different times, with different coders. It may involve two or three people applying the same recording instructions independently to the same set of data (Boyatzis, 1998; Krippendorff, 1980). No method of reliability is devoid of criticism, and inter-rater reliability is no exception. This has been criticised on the grounds that either through tiredness, or in an attempt to fulfill his/her commitment to the task, the independent rater may fail to accurately record, or bias the data (Robson, 2002). However, there are several means by which reliability can be increased, including through increasing the consistency of the setting in which the information is collected (i.e. presenting the interview in the same order every time) (Boyatzis, 1998), and defining the codes created from the transcripts rigidly and exhaustively (Holsti, 1969). Both methods were used in the present study to increase reliability.

Percentage agreement was used to calculate the extent to which both the researcher and the independent rater agreed in their assignment of text from the transcripts to the codes created. Percentage agreement is calculated in the following way:

$$\text{Percentage Agreement} = \frac{\text{The number of times both coders agree}}{\text{The number of times agreement was possible}} \times 100$$

This method of reliability has several disadvantages, including that some agreement will have occurred by chance (Rust and Cooil, 1994; Topf, 1986). Other researchers have taken the element of chance into account in their reliability estimations (Cohen, 1960; Scott, 1955). Despite this, percentage agreement was used to calculate reliability, for two main reasons. Firstly, it is easy to calculate and understand. Secondly, due to the straightforward nature of the coding i.e. assigning text to codes which came from categories developed from responses to questions presented in the same order in every interview, a high level of agreement would be expected, thereby reducing the likelihood of any chance agreement. A level of 80% agreement is considered satisfactory in inter-rater reliability (Hartmann, 1977).

A second individual was asked to code the interview data. This person was an experienced researcher, with no knowledge of the purpose of the study. Once agreement to code the data had been reached, the independent rater was allocated a random 10% of the interview transcripts, along with a list of codes developed from identified categories in the transcripts. The rater was instructed to assign the appropriate text to the codes. In order for there to be agreement, the same piece of text had to be assigned to the same code. This was represented by a score of 1. Any level of disagreement was scored 0. Agreement was summed in terms of the number of codes in which it was possible to reach agreement.

The third main stage of a data-driven thematic analysis involves validating the developed code (Boyatzis, 1998). After the reliability of the coding was achieved, validity was tested through ensuring the codes applied to all attribution responses.

4.5.3 Quantitative Data Analysis

4.5.3.1 The Database

To quantify all of the interview data, some demographic data was coded as a category (gender, marital status, present employment, type of pain). The other parts of the coded interview transcripts were converted into a form for statistical analysis using presence/absence coding (Boyatzis, 1998). The most frequent three or four categories to emerge from responses to each interview question were scored as present or absent for each individual. For example, for attributions, when asked about blame for the pain onset, if most or a large number of participants blamed others for their pain onset, then attributions to "Others" would form a frequent category for that question. Each person who blamed others for his/her pain onset would be assigned a value of 1 indicating the presence of this thematic category. On the other hand, those who did not blame others for their pain onset would be assigned a value of 0, indicating that they did not give this response. This procedure was applied to all of the most frequent categories to emerge.

It was possible that multiple responses could be given in response to a question, resulting in more than one category being scored as present for an individual. For example, a person blaming him/herself and others for their pain onset, which were common categories to emerge in response to the question about blame for the pain onset, would result in two categories being scored as present for that individual. Where participants reported multiple responses that fell into the same category, this was scored as present only once. For example, those who blamed their spouse and their employer i.e. others for their pain onset would only be scored as having blamed others once.

The presence/absence data from the interview schedule, and the actual scores obtained on the pain and just world questionnaires were entered into SPSS (Windows) v 9.0. To ensure all data had been entered correctly, frequencies were obtained for the interview data, and descriptive statistics (means, standard deviations, minimum and maximum scores) were obtained for the questionnaire data. The few random errors made involved mistakes in keying in the data. They were identified through comparing frequency counts with counts in the interview data, and determining outlying values and skewed scores in the questionnaire means. All errors were corrected by referring back to the coded interviews and questionnaires and entering the correct values. These methods of analysis were then run again to ensure the reliability of the database.

4.5.3.2 Missing Data

Data was missing from both the interviews and questionnaires. For questionnaire (scale) data, missing data has been identified as a serious problem in data analysis. The pattern of missing data is more important than the amount of missing data. Random missing values pose fewer problems than non-random values, because the latter affect the generalisability of the results (Tabachnik and Fidell, 1996). There are no firm guidelines for how much missing data can be tolerated for a sample of a given size, and so a 10% level was set beyond which a measure was classed as unreliable. No data was missing in the Just World Scale. However data was missing for two participants on the short-form McGill Pain Questionnaire (3.2% of the sample), due to the misplacement of the data. There are a variety of methods for handling missing data, such as deleting cases or variables, or estimating missing data (Tabachnik and Fidell, 1996). However, in the present study the data was scored as missing, and assigned a value of 46 to represent this (since the maximum score on the scale was 45). The data was handled in this way because there were few missing values, and so could afford to represent the data as it was.

Missing interview schedule data was due to researcher error, failing to ask some questions of participants. In total, 19% of the sample were not asked one of the interview questions. This is percentage is negligible when considering that there were 24 questions asked of 64 participants in the main study (see Appendix 3.4) for the main study interview schedule). Using the same criteria as the quantitative data, this comprised less than 10% of missing data in each of the interview questions. Since the absence of a response cannot be compensated for, all missing interview data was assigned a value of 9 in the categories of missing data.

4.5.3.3 Statistical Technique: Factor Analysis

Factor analysis can be used to simplify data within a large correlation matrix by organising the data into related factors, each of which are independent of each other. Principal components analysis (PCA) was used in the present study to calculate the empirically derived subcategories of data. This produces factors that are uncorrelated with each other, explains all of the variance in a correlation matrix, and produces eigenvalues indicating how much variance each component accounts for. The factors initially produced are subject to rotation before they can be interpreted. The most appropriate type of rotation for uncorrelated factors is varimax rotation. This aims to maximise the variance produced (Kline, 1994, p.67). Within each factor are factor loadings, representing the correlation of the variables with the factors. These loadings indicate how much variance a factor can account for in that variable. Comrey (1973) considered loadings in excess of 0.71 to be excellent, 0.63 to be very good, 0.55 to be good, 0.45 to be fair, and 0.32 to be poor.

After rotation, the factor eigenvalues and scree plot are used to determine the number of factors produced in factor analysis. Factors with eigenvalues greater than 1 are retained (Tabachnik and Fidell, 1996, p.620). The scree test consists of eigenvalues plotted against each of the factors (Cattell, 1966). Eigenvalues within the scree test are negatively decreasing, such that the eigenvalue for the first factor is greater than for the second, which is greater than for the third, and so on. The number of factors within a scree plot can be determined by looking at a point in the plot where a line drawn through the points changes slope (Tabachnik and Fidell, 1996, p.621). It is the factors before the change in slope which are retained. The factors identified produce factor scores that can be used in subsequent analyses.

In the present study factor analysis was used to order the thematic categories into statistically related groups of items.

4.5.3.4 Reliability of Categories and Subscales

The reliability of the factors obtained using PCA, and of the theoretically derived subscales of the questionnaire data was calculated using Cronbach's alpha coefficient. This is a psychometrically derived means of testing commonalities among items in a scale, under a variety of situations. A reliability value of 0.7 or above has been considered suitable for statistical analysis (Nunnally, 1978, p.425).

4.5.3.5 Statistical Technique: Chi-Square Analysis

Chi-square investigates whether there is a relationship/difference between variables. It is a test of statistical significance that allows a researcher to determine the probability that the observed relationship/difference between variables may have arisen by chance (Bryman and Cramer, 1994, p.159). The test starts with the assumption that there is no relationship/difference between the variables being examined (the null hypothesis). To determine if there is a relationship/difference, the null hypothesis needs to be rejected. If it is confirmed, the proposition that there is a relationship/difference must be rejected. The chi-square statistic is then calculated by comparing the observed frequencies in each cell of a contingency table, with those that would be expected on the basis of chance alone. The greater the difference between the observed and expected frequencies, the larger the ensuing chi-square will be. The next stage in the chi-square is to determine a significance level, reflecting what may be an acceptable risk that the null hypothesis may be correctly rejected. This is commonly set at the 0.05 level. There are different significance tests that can be calculated. Yates' Continuity Correction should be reported with a 2x2 table, because this compensates for the overestimation of the chi-square when a 2x2 table is used. Pearson's chi-square should be reported with larger tables.

Chi-square only determines if there is a relationship/difference between variables, it does not convey information about the strength of this. In order to determine the strength of a relationship from a contingency table, the Cramer's *V* statistic can be used. This derives in large part from chi-square, and provides values between 0-1, with higher values indicating stronger relationships between variables (Bryman and Cramer, 1994, p.178).

In the present study 2x2 chi-squares were conducted to determine differences and associations between attribution and adjustment categorical variables. Larger chi-squares were conducted to determine differences between demographic and pain-related variables on attribution and adjustment categories.

4.5.3.6 Statistical Technique: Correlation

Correlation analysis is used to describe the strength and direction of a relationship between two variables (Pallant, 2002, p.115). There are different types of correlation analyses. Pearson product-moment correlation can be used to determine associations between continuous variables. The output from this correlation provides both the correlation coefficient, *r*, and the square root of this correlation, corresponding to the to the proportion of the variation in values of one of the variables which can be predicted from variation in the other variable. If this is low, i.e. around the value of 0.3 or less, then there is little value in continuing to investigate a relationship. In the present study, Pearson's product-moment correlation coefficient was calculated to determine the strength of the relationship between continuous variables, namely pain intensity and just world scores.

4.5.3.7 Statistical Technique: Regression

Regression analyses can be used to determine the relationship between one dependent variable, and a number of independent variables (Pallant, 2001, p.134). The principles of regression are based on correlation, but allow for more sophisticated exploration of interrelationships among a set of variables. In particular, it can be used to determine how well a set of variables are able to predict a particular outcome; which variable within a set is the best predictor of an outcome, and whether a particular predictor is still able to predict an outcome when the effects of another variable are controlled for. When the dependent and independent variables are continuous, multiple regression analyses should be conducted. There are various different types of multiple regression, and various assumptions must be met before this analysis can be conducted (see Tabachnik and Fidell, 1996). In stepwise regression, the order of entry is based on statistical criteria. Stepwise regression is useful when there is no theoretical rationale for determining the order in which variables should be entered into the equation. This procedure not only predicts the overall explained variance, but also assesses the unique contribution of each variable or a set of variables after taking account of variables already entered into the equation. In the present study stepwise multiple regression was used, where the statistical program used selected the independent variables to be entered into the analysis, and in which order, to determine attribution and adjustment predictors of just world and pain scores.

Logistic regression analysis is a method for determining which of a number of categorical or continuous independent variables best predicts a categorical dependent variable (Field, 2002, p.163). There are a number of different methods that can be used in logistic regression (Field, 2002, p.168-170). In the present study the forced entry method was selected. In this method all of the covariates are entered in one block, and parameter estimates are calculated for each block (Field, 2002, p.168). The forced entry method was used to examine relationships between each of the health, psychological and functioning adjustment outcomes (see section 4.3.3.8), and causal attributions made and not made for the pain now.

4.5.3.8 Statistical Technique: Analysis of Variance

Analysis of variance (ANOVA) is used to compare two or more means to determine if there are any reliable differences between them (Tabachnik and Fidell, 1996, p.35). Specifically, it compares the variance (variability in scores) between different groups (believed to be due to the independent variable), with the variability within each group (believed to be due to chance). The F ratio represents the variance between groups, divided by the variance within groups. A large F ratio suggests that there is more between-group than within-group variability, and if this between-group variance is significant, then the null hypothesis that the group means are equal can be rejected (Pallant, 2001, p.168). There are different types of ANOVA. One way between-groups ANOVA is used when there is one independent grouping variable with three or more levels, and one continuous dependent variable (Pallant, 2001, p.187). This was employed in the present study to explore differences between demographic and pain-related variables on pain and just world scores. The two-way between-groups ANOVA is used when there is one continuous dependent variable, and two independent variables, with two groups in each variable (Pallant, 2001, p.201). This was used in the present study to explore differences between attribution categorical variables on pain and just world scores, and was expanded to three or four-way ANOVAS to consider individual differences in pain intensity scores. Finally, in a one-way repeated measures ANOVA each subject is measured on the same continuous scale at least three times (Pallant, 2001, p.196). This was used in the present study to examine any differences in current, usual and worst pain intensity scores.

A significant ANOVA result does not reveal which of the independent groups differ on the dependent variable. For this, a post-hoc test must be carried out. A variety of post-hoc tests have been identified (see Pallant, 2001, p.173 - 175). In the present study two post-hoc approaches were adopted: Tukey's Honestly Significant Difference Test (HSD) was used in one-way ANOVA to determine specific differences between categorical grouping variables with more than three levels, on one dichotomous dependent variable. The Bonferroni procedure was used in repeated measures ANOVA to determine where significant differences lay between current pain scores, usual pain scores, and pain scores when at its worst.

4.5.3.9 Interpreting Results: Causality

Chapter 2 (section 2.3.5) criticised the literature reviewed for not determining the causal nature of the attribution/adjustment relationship. In the present study none of the chi-square tests of association between attribution and adjustment variables revealed anything about the causal nature of this relationship. However, this may be difficult to determine, given that various factors, both overt and hidden may mediate the relationship.

4.5.3.10 Interpreting Results: Statistical and Clinical Significance

Statistically significant results differ from results that are of clinical significance. For example, although it may be significant, the practical importance of a correlation of 0.2 is limited (Pallant, 2001, p.112). Additionally, the chance of obtaining a statistically significant result increases with the size of a sample (Robson, 2002, p.400). For these reasons, the clinical as well as statistical significance of the results produced in the present study was considered.

4.5.3.11 Interpreting Results: Type 1 and Type 2 Errors

Two types of error can be made in the interpretation of statistical analyses. Firstly, a Type 1 error involves thinking there is an interaction between two variables, when perhaps there might not be. This might be the result of conducting a large number of analyses, resulting in some significant results being produced by chance. This can be minimised through selecting an appropriate alpha level, such as 0.05. This was selected in the present study. The second type of error, a Type 2 error, occurs when it is believed that there is no interaction between two variables, but in fact there might be. This could be because of a lack of power or small sample size (Pallant, 2001, p172-173). Both types of error were considered in the interpretation of statistical analyses.

4.5.4 Data Analysis of the Study Aims

Qualitative and statistical methods were used to analyse the aims outlined in Chapter 3 (section 3.3). The first aim was to examine the cause, responsibility and blame attributions made for pain, in the ways outlined in section 3.3.1. However, before this, a qualitative thematic analysis was undertaken of the pain attributions made. Four categories emerged from this and were considered in the analysis of the aims. In terms of analysis, frequencies were used to represent the making and nature of the attributions made. Descriptive and statistical analyses were used to determine whether cause, responsibility and blame were distinguished from each other. Descriptively, different responses being given for each concept was taken as an indication that distinctions were made between them. Statistical analysis took two forms. Firstly, chi-square analyses were conducted to determine associations between pairs of concepts, and secondly, factor analysis determined any common groupings among similar responses given across all three attribution types, for both time periods. To examine changes in attributions, each common response across cause, responsibility and blame were combined, represented as frequencies, and subject to chi-square analyses between both time periods. Justification for adopting this method of determining changing attributions is provided in Chapter 5. Finally, all types of causal attributions made for the pain now were combined to represent the making of these attributions at one time, and subjected to chi-square analyses with possible motives for making them, involving knowledge and uncertainty factors, to determine any associations between them.

The second aim was to examine ways of adjusting to pain using a variety of health, psychological and functioning outcomes (Chapter 3, section 3.3.2). The nature of adjustment reported was analysed using content analysis, and chi-square analyses were used to examine differences between emotions reported at the pain onset, now and since, to determine changes in emotions.

The third aim was to explore the nature of the relationship between cause, responsibility and blame attributions, and adjustment to pain. There were five parts to this (Chapter 3, section 3.3.3). Firstly, logistic regression analyses were conducted to determine any differences in the ability to predict adjustment between those who made causal attributions for their pain now (combined responses), and those who did not, i.e. reporting their pain is "just there". The literature typically examines these differences for the pain onset (Chapter 2, section 2.3.2), but was not possible in the present analysis because most participants made attributions for their pain onset. Secondly, chi-square analyses were conducted to determine any associations between the causal attribution categories "Physical External" and "Physical Internal" attributions, and the health, psychological and functioning adjustment outcomes. Thirdly, chi-square analyses were conducted to determine whether self-responsibility/blame attributions were adaptive for adjustment to pain, and fourthly, whether other-responsibility/blame attributions resulted in poor adjustment to pain. Fifthly, chi-squares were conducted to determine whether combined responses within the attribution categories, "Physical External", "Physical Internal", "Self" and "Others" across all three attribution types were associated with adjustment at some times in the pain experience more than others.

Within the literature, attributions for the onset of pain/illness/injury are associated with current adjustment to the situation (Chapter 2, section 2.3). In the current analysis this was extended to include the attribution/adjustment relationship for the same time, i.e. both for the pain onset, and now.

The fourth aim was to explore the role of just world beliefs in the experience of pain (Chapter 3, section 3.3.4). There were three parts to this. Firstly, mean values were used to determine the strength of the just world beliefs held by the pain sufferers. Secondly, analysis of variance (ANOVA) techniques were used to examine differences in the just world scores within types and duration of pain groups. Thirdly, ANOVAS were conducted to determine any differences in just world scores between those who made causal attributions for their pain now (combined responses), and those who did not, and between those who attributed responsibility and blame for their pain to themselves, versus others.

The final aim was to examine differences in adjustment outcomes between those with different strengths of just world beliefs (Chapter 3, section 3.3.5). To achieve this, the just world scores were converted into low, medium and high scores, representing different strengths of belief. Chi-square analyses were conducted to determine any differences in all of the health, psychological and functioning outcomes, between these groups.

The last section of the analysis was an exploratory investigation of interactions between pain intensity and all study variables. A variety of statistical techniques were adopted in this exploration. Firstly, ANOVA was conducted to determine any individual differences in pain intensity. Secondly, stepwise multiple regression techniques were used to examine the ability of the attribution categories "Self" and "Other" to predict pain intensity. Thirdly, Pearson's product-moment correlation coefficient was calculated to determine any initial associations between pain intensity and just world scores. Fourthly, stepwise multiple regression analyses were used to determine whether any adjustment outcomes predicted pain intensity. Additional, chi-square analyses were also conducted to determine any differences in adjustment between different strengths of pain intensity groups.

4.6 MAIN STUDY METHOD

4.6.1 Introduction

This section will outline the method employed in the main phase of the study, in terms of the participants recruited and the recruitment methods, and the data collection procedure. A description of the demographic and pain-related characteristics of the sample will also be provided.

4.6.2 Method

4.6.2.1 Subject Selection and Recruitment

The participants were recruited using all three methods outlined in section 4.2.2.5. Eleven percent of the participants were recruited through being approached in the medical centre. Seventy percent of those who were approached agreed to participate. The majority of the participants recruited into the main phase of the study contacted the researcher by telephone, volunteering their participation. Most of these came from the media advertisement (55%), while the remaining 34% of the participants were recruited using the poster advertisement.

Regardless of the method of subject recruitment, all participants indicating an interest in the study were given further information about the study, either in person, in the medical centre, or over the telephone. Following this, all participants still agreed to participate. Arrangements were then made to meet, either in their own homes, or the university department where the study was based. In total 64 pain sufferers were recruited into the study.

4.6.2.2 Procedure

Regardless of where the data was collected, the participant and researcher were alone. After introductions had been made, each participant was given a Participant Information Sheet to read, providing more information about the study (see Appendix 4.1 for the sheet), before signing a consent form (see Appendix 4.2 for the consent form). Once written consent had been obtained, data collection began. Some participants had multiple pain complaints, but were encouraged to focus on their worst complaint for the interview. Initially, the SF-MPQ was completed three times to investigate current, usual and worst pain intensities. The scale was completed under the guidance of the researcher who read aloud each of the 15 descriptors, pain word options, and presented participants with the pain gauge. This guidance was to ensure all participants completed the questionnaire with the correct pain frame in mind. The scale was completed using the format outlined in Chapter 2 (section 2.1.6.3), and was completed first to focus the participants on their pain intensity.

The interview schedule was then introduced, with the following instruction:

"Before beginning the interview I would like to ask you to be as honest as possible in your responses, giving your own true responses. I would also like to establish if you have more than one type of pain, and if so, I'd like to focus on the pain that is your worst pain. Is any court action being taken over your pain? I'd like to assure you that any court action related to your pain will not be affected by your responses. Any information you give me will be strictly confidential. Please indicate if at any time you do not understand something in the interview."

The questions were asked in the same order throughout all interviews, and were conducted by each person (see Appendix 3.4 for the order of the questions). This was to minimise any "interviewer effects", by keeping the interviewer constant in all interviews (Breakwell, 2000). Each new section of questions was introduced to the participants. For example, the attributions section was introduced with the following instruction:

"I would like to let you know that a few attribution questions may be asked more than once. The fact that you may be asked them more than once (it will become clear why this is) does not necessarily mean that you have to change your responses the second time. I am only looking for your true responses in each instance. Is this clear?"

All interviews were tape-recorded with permission.

Participants then completed the Just World Scale, introduced as a Social Opinion Survey, as has been done in other research to avoid any bias that may result from participants being aware they are completing a measure investigating justice beliefs

(Miller, 1977). Each participant completed the scale alone, to avoid socially desirable responses that may emerge from the presence of the researcher, using the format outlined in Chapter 2 (section 2.2.4.5).

Data collection lasted approximately 40-45 minutes. Once collected, any other information given in social conversation was discarded, and goodbyes were exchanged.

4.6.2.3 Reliability and Validity of Interview/Questionnaire Data

In terms of the reliability of the interview data, a 91% level of agreement was found on the text assigned to the emergent categories, suggesting the coded data was reliable. In terms of the reliability of the questionnaire data, Cronbach's alpha values of 0.69, 0.78 and 0.87 were obtained on the combined sensory, affective and overall scores on the short-form McGill Pain Questionnaire (Melzack, 1987) for the present, usual and worst pain intensities respectively. Additionally, together the just world and unjust world items on the Just World Scale (Rubin and Peplau, 1975) achieved very low reliability. However, when these were added to the overall scores, an alpha value of 0.75 was obtained for the scale.

4.6.3 Demographics and Pain History of the Study Sample

Data from two of the 64 participants could not be analysed, because one participant discussed multiple pain complaints, and the other participant had a speech impediment, which made it impossible to determine her responses when listening to the tape-recording of her interview. Thus, data was analysed from 62 participants. Most of these participants were female, with a mean age of 51.05 years. They were also married with children, and were employed at the time of the study. Additionally, half of the subjects were religious. A variety of pain complaints were reported, the most frequent of which were back/spinal pain, and arthritis. The mean pain duration of the sample was 8.15 years. Table 4.1 summarises this information.

Table 4.1: Summary of demographic and pain-related variables

Measure		
Gender	Male = 20 (32.3%)	Female = 42 (67.7%)
Marital Status	Married = 33 (53.2%)	Separated = 3 (4.8%)
	Widowed = 6 (9.7%)	Divorced = 8 (12.9%)
	Single = 12 (19.4%)	
Children	No Children = 16 (25.8%)	Has Children = 46 (74.2%)
Present Employment	Employed = 21 (33.9%)	Student = 8 (12.9%)
	Retired = 22 (35.5%)	None = 11 (17.7%)
Religion	Not Religious = 31 (50%)	Religious = 31 (50%)
Type of Pain	Back/Spinal = 18 (29.0%)	Arthritis = 17 (27.4%)
	*Upper Body = 14 (22.6%)	**Middle Body = 8 (12.9%)
	***Lower Body = 5 (8.1%)	
	Mean (SD)	Range
Age	51.05 years (15.31)	18-84 years
Duration of Pain	8.15 years (8.86)	1 month – 47 years

*Upper body pain = e.g. head, neck, shoulder pain

**Middle body pain = e.g. stomach, hip pain

***Lower body pain = e.g. knee, ankle pain

4.7 SUMMARY

This chapter outlined the method employed to meet the aims of the present study detailed in Chapter 3. Details of, and rationales for the variables examined in the study, the measures used, and the study sample and method employed were provided. The study population consisted of a sample of adult pain sufferers recruited from the community. They were suffering from different pain complaints, and had pain for various periods of time. A rationale for these criteria was provided.

The present study was an exploratory investigation to consider shortcomings of literature measuring attributions, just world beliefs and adjustment in pain. The study was exploratory because all three concepts have not before been measured in this way before. A semi-structured interview schedule was developed to consider the following shortcomings of the pain literature. Firstly, no research has empirically distinguished between cause, responsibility and blame in pain. Secondly, no studies in pain have defined all three concepts as a basis of distinguishing between them. Thirdly, no attribution measures employed in any study, including in pain research, have allowed its participants to make any or no cause, responsibility or blame attributions at all. Fourthly, few studies have examined the extent to which cause, responsibility and blame attributions for pain change over the pain experience. Fifthly, no studies have allowed pain sufferers to define their own adjustment to pain. Sixthly, few pain studies have examined the extent to which adjustment to pain changes over the pain experience. Finally, no research to date has measured just world beliefs in pain. The importance of addressing these issues in pain was considered in Chapter 2 (sections

2.2.3.9, 2.2.4.7, 2.3.5 and 2.3.6). In general, all suggest it is important to address the issues in order to develop a clearer understanding of the role of attributions and adjustment in pain, and to determine whether there is a role for just world beliefs in pain.

The interview schedule was initially piloted to ensure its reliability and validity. The result of this was a revised interview schedule used in the main data collection phase, along with a pain and just world questionnaire to investigate the aims of the study. Details of and the rationale for these instruments were discussed, along with the way in which they were applied.

The way in which the data was managed was also discussed. This included details on the analyses conducted on each of the aims, and the way in which the interview and questionnaire data were prepared for this analysis. Details of, and rationales for the statistical techniques adopted in the present study were given. The way in which errors and missing data was handled was also described, along with the way in which the results were interpreted. The chapter ended with a discussion of the method employed in the main phase of the study.

CHAPTER 5: MAIN STUDY RESULTS

5.1 INTRODUCTION

This chapter will outline the results of the main phase of the study, in two sections. The first section will present the results of a qualitative analysis considering the thematic content of pain attributions. The second section will present a quantitative analysis of the five aims listed in Chapter 3 (section 3.3). Throughout the analysis of these aims, demographic and pain-related variations within the variables will be considered, along with any potential variables mediating or moderating interactions found. The last section will explore interactions between pain intensity and the main study variables. Given the exploratory nature of the present study, it was not feasible to report all non-significant results from the statistical analysis. Instead, only those non-significant results of particular importance to the exploratory investigation were reported. A full interpretation of the results will be made in Chapter 6.

5.2 QUALITATIVE RESULTS

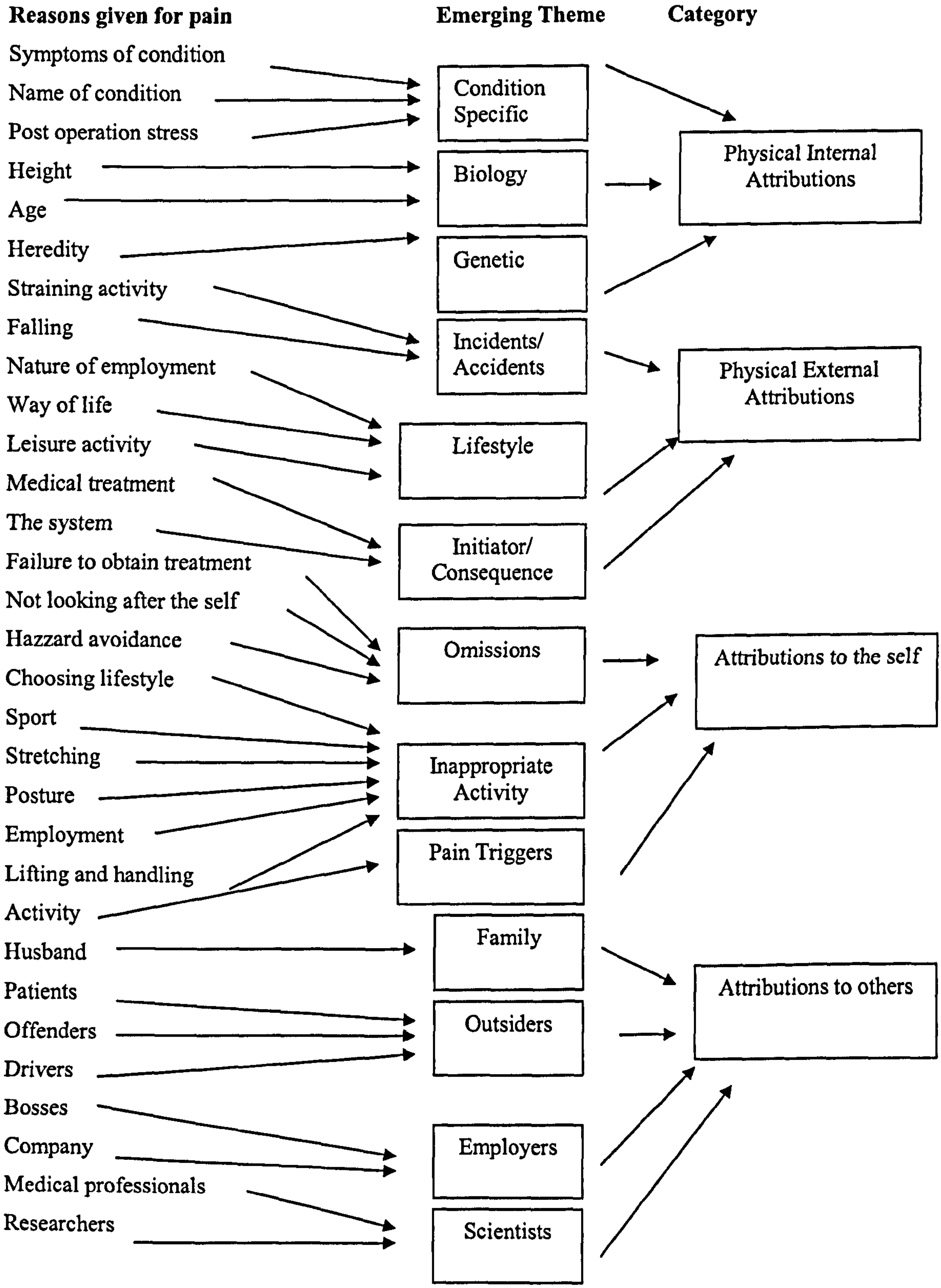
5.2.1 Introduction

Chapter 4 (section 4.5.2.3) considered the method of thematic analysis of the attribution responses. This section will present the results of this analysis, by outlining the process through which each of the "Physical Internal", "Physical External", "Self" and "Others" categories emerged from pain attributions, in a diagram, before considering the precise nature of each category in detail. This section will end with a summary of all categories.

5.2.2 Summary of Process of Thematic Analysis of Pain Attributions

Diagram 5.1 outlines the process of thematic analysis of pain attributions, starting from the responses given, themes emerging from the responses, and the categories developed from this.

Diagram 5.1: Process of thematic analysis of pain attributions



5.2.3 Category 1: Physical Internal Attributions

Diagram 4.1 (Chapter 4, section 4.5.2.3) defined a "Physical Internal Attribution" in terms of physical internal states i.e. factors originating within the body. This category was developed from three common themes that emerged from the pain attributions made. The first theme to emerge, "Condition Specific", involved three different types of response. The first was attributions to the "Symptoms of a condition". This was characterised by reports that pain conditions such as arthritis, sciatica in the leg, and back pain originated from a variety of symptoms, including a viral infection, injury, nerve damage, and swelling:

> *"I had a throat infection, a viral infection...that's where they reckon the immune system reversed itself"* (10)
>
> *"Its been suggested that the problem actually has come about via a sports injury"* (48)
>
> *"..The pain is caused by swelling in the back, but what started that I don't know"* (49)

There were also reports of similar symptoms being reported for arthritis and back pain:

> *"Just joints, wear and tear. That was what was explained to me at the time. Just wear and tear of the joints"* (4)
>
> *"..It just stems back from when I was younger and ....it was just wear and tear of the joints"* (24)

> *"...through wear and tear through the ages while I was working with (company) doing removals. Lifting heavy gear"* (14)

An opposing type of response to this emerged, "Named condition", where attributions were made to the name of a condition originating within the body, instead of its symptoms. So, for example, instead of making attributions to "wear and tear", participants would make attributions to "arthritis" itself:

> *"It's just, it eh, I've got rheumatoid arthritis, that would cause it...I don't know what caused the rheumatoid arthritis, but I'm saying that's what would cause the pain"* (5)
>
> *"...I feel it was just, eh onset of arthritis which eh I have been diagnosed with since I was in my teens"* (11)

Other conditions mentioned included irritable bowel syndrome, and endometriosis:

> *"Well... I really thought to begin with it was just part of irritable bowel syndrome"* (27)
>
> *"Well, I know that the disease endometriosis causes ma pain, but em, I don't know what causes that disease to begin with"* (55)

A closer examination of the participants who gave both types of response revealed that those who made attributions to symptoms of their condition, had experienced pain for over double the duration (up to 15 years) of those who made attributions to a named condition (up to seven years). This suggests the possibility that as time goes on, people focus more on their symptoms than their actual condition when discussing their pain. However, this was only a minor noted difference, and it may just be that people have different styles of explaining their pain situation.

The third type of response was "Post-operation stress", where an attribution was made to internal stress as a result of surgery to treat osteoarthritis as an explanation why pain had not resolved at the time of interview:

> *"Post-operation stress...I can't seem to think of anything else that caused it" (50)*

The second theme to emerge was "Genetic", where some participants reported the onset of conditions such as arthritis, migraine, angina, and the spinal condition adhesive arachnoiditis, to originate from "Heredity" factors in general, or from their family, specifically their mother. For example:

> *"I do believe that it was genetic..."* (3)
>
> *"Em... (pause) in the very first instance I think it's inherited. It's a family trait"* (30)
>
> *"Em, probably my mother passing on the gene, that caused this...hereditary"* (47)

There was also some indication that attributions to heredity factors were made in the absence of an obvious explanation for the pain onset, it suddenly appeared:

> *"To begin in the first place? Well, it was genetic. I mean, all of a sudden, I had a really bad backache and it just didny go away...I didny do anything for the pain to come. It just appeared"* (17)

The third, smaller theme to emerge was "Biology", involving participants making attributions for their back pain to "Height" and "Old Age".

5.2.4 Category 2: Physical External Attributions

Diagram 4.1 (Chapter 4, section 4.5.2.3) defined a "Physical External Attribution" in terms of factors outwith the body, i.e. in the environment. This category was developed from three common themes that emerged from the pain attributions made. The first theme, "Incidents/Accidents", involved two main types of response. The first involved "Falling", where participants mostly suffering from back pain reported that falling over in a range of situations brought about their pain. There were reports of falling over in general:

> *"I fell fifteen years ago, and broke my wrist, and I fell on my bottom, so it was the bottom at my spine, that took the knock. So that may have been the start of it"* (43)
>
> *".....this pain, which is a lot more than normal osteoarthritic pain, was caused by the fall. I did always have the arthritis, but it was aggravated by falling, I think"* (9)

and falling over in various situations, including slipping up and falling over potato brie in a shop, falling over a hairbrush lying on the floor, being knocked over by a heavy goods vehicle, and falling off a ladder:

> *"Em...the cause, mmm (pause), the cause of my pain.....was the fact that the ladder broke and I fell off it"* (25)

falling over while trying to arrest someone:

> *"Somebody, objected to me tryin' to arrest them. And, assaulted me, and durin' the assault I landed on the ground on top of either a stone or a brick, which was the initial injury"* (54)

falling out of a rubber tyre being pulled along in water:

> *"....it was actually the force of me, hitting the water at great speed that caused the actual, physical damage to the shoulder"* (42)

and being pushed back and falling over whilst playing football:

> *"Well, when it happened two of us went up to get it (the ball) and I got pushed back, so I landed differently than I would have done if I'd fallen on my own"* (60)

The second type of response within this theme, was "Straining Activity", involving reports that a variety of factors led to back pain, including leaning too roughly whilst making a bed, sneezing too vigorously, overstretching reaching for a far away object:

> *"The back, overstretching. It clicked....I stretched too far"* (16)

and twisting the back whilst moving a caravan:

> *"....Moving a caravan... we were turnin' the caravan roon aboot an' it's the only thing I can think of, that caused it....Just movin' the caravan must have just twisted masel"* (38)

The second theme to emerge, "Lifestyle", was characterised by three different types of response. The first, "Nature of Employment", was characterised by attributions for the pain onset made to various types of employment participants used to occupy, mostly involving manual labour, such as being a cleaner, floorlayer, removal person, and nursing assistant. Most participants who made these attributions were suffering from back-related pain. Some attributions were made to the job in general:

> *"Just the job"* (53)

while others were made to factors that would put strain on the back, including lifting heavy objects:

> *"...I worked too long with lifting those heavy things instead of leaving it and going back to (work on the) buses when I started to get a bit older"* (14)

and bending over and standing a lot:

> *"(Pause). I think it was mainly caused due to my work. Especially for long hours, heavy lifting, and often having to work, you know when I was on call,*

> *work on my own without any help, you know difficult patients to lift, moving, and also bending over and just standing a lot of the time"* (31)
>
> *"....my work, because I have to do the job I'm doing....and it involves standing"* (43)

Job-related attributions were also made for the onset of arthritis, and involved getting wet at work:

> *"I blame the hard work at the school...You know you used the big scrubbing machines, down on your hands and knees, constantly wet, and you don't go away and dry your hands... "* (12)

One participant reported that he was not in his normal job at the time of the accident:

> *"Well, it's the job I was doing and the employment I was in. My employment changed because we were privatised. So you were having to do jack-of-all-trades. But if I'd been in my normal job, the accident wouldn't have been there"* (7)

At the time of interview, one attribution for the pain not having resolved involved still working in the situation that brought about the pain in the first place:

> *"Possibly continuing to work in the same sort of situation, lifting and getting into struggles (with patients)"* (1)

The second type of response, "Way of life", involved reports by older participants i.e. aged 60 years or older, that previous lifestyle factors, including diet, and unhealthy behaviours such as smoking, drinking too much alcohol, and staying up too late at night brought about their pain in the first place:

> *"I think probably lifestyle...combined with a few wrong eating habits, and I genuinely believe that acids build up in the body, as a result of this. And only if those are got rid of, eh will improvement be found"* (20)
>
> *"I think it stems back to World War II, where the food was rationed, and we were on a very limited diet. And I don't think the structure was put into children's bodies, and now it manifests itself in our older age"* (18)
>
> *"Em, my lifestyle, probably contributed to it...."* (40)
>
> *"Well, the smoking"* (35)

The third type of response to fall under the "Lifestyle" theme, was "Leisure Activity", characterised by reports that gardening, sport and athletic activities led to pain:

> *"My sporting activities"* (33)
>
> *"I have my doubts, that it may have been my enthusiasm for gardening, in my later years, may have started this problem of my hip joint needing repaired, but I do not know about that"* (18)
>
> *"I was very athletic when I was younger, a lot younger. I did a lot of gym work. Jumping over horses etc. that kind of thing, and I think that sometimes..I was a bit too energetic and that's what wore my joints out"* (4)

The third theme to emerge was "Initiator/Consequence", which involved responses by participants that various types of "Medical treatment" either initiated, or led to a worsening of their pain. Attributions were made to a range of medical treatments, involving treatments for other conditions that led to the onset of the existing condition, such as the side-effects of medication:

> *"....what's causing it (pain) is the medication, the tablets"* (11)

wrong exercises advised by a physiotherapist:

> *"....the exercises given by the physiotherapist"* (58)

and operations that brought about pain:

> *"I would still think it was the, having the hysterectomy that triggered it off"* (6)
>
> *"...it was just through my operations and that, that it's all come about"* (8)

Some participants also reported that operations to treat their original pain condition were the source of them still having pain at interview. This was either because they felt that a swab had been left in after surgery:

> *"...In my wilder moments at night when I'm in real pain I began to wonder if they'd left a swab in"* (27)

and because of adhesions developed as a result of surgery:

> *"Well I I believe that it's just my hard luck that I've developed adhesions, em…since, the surgery"* (64)

There was also a report that a refusal to have an operation to treat angina is the reason why pain has not resolved:

> *"…Unless I was to go through an operation which they said could eliminate the pain which I said I didn't want to go through"* (40)

Related to "Medical Treatments", a single response, "The System" was given, where a report was made that pain at the time of interview was due to the having to wait for medical treatment:

> *"….the system for not picking up what was wrong….the waiting lists, the fact that you have to wait forever to see people"* (58)

5.2.5 Category 3: Attributions to the Self

Chapter 4 (section 4.5.2.3) defined "Attributions to the Self', as any responses made by participants that involved attributions to themselves. This category emerged from three common themes to emerge from the pain attributions made. The first, "Omissions" was characterised by responses that pain resulted from or was made worse by a failure to do certain things. Three types of response were relevant to this. Firstly "Hazard avoidance" where some participants made attributions to themselves for failing to avoid or notice situations that led to them having an accident that resulted in pain. This took the form of not being quick enough to move one's arm out of the way of washing machine, not being quick enough to avoid being attacked by a patient at work:

> *"...I partly blame myself for not being quick, enough, to stop it"* (45)

and failing to notice potential hazards:

> *"In part myself...I should have noticed it (potato brie on a floor). I wouldn't have slipped"* (26)
>
> *"Maybe I should have been more aware of the fact that the path was icy...I was partly to blame because eh, I should have been aware of the, icy conditions"* (56)

The second type of response, "Not Looking After the Self", was female-dominated, characterised by reports that the onset of pain was due to a failure to look after the self properly:

> *"Yes...I have a tendency of not looking after myself, physically..."* (62)

through allowing the self to become stressed, resulting in injury by falling over when stressed, and failing to rest, compounding an initial injury:

> *"Well...I've had a sore back since June, and I've I've had two falls before then, and one since then, and em...I think I'm responsible because when it started...I was told to go off work and rest, and I didn't do it"* (51)

The third type of response, "Failure to Obtain Treatment" involved participants making attributions to themselves for failing to obtain treatment in a variety of ways, including not receiving further treatment after the initial pain onset:

> *"Possibly myself in not going back to the doctors"* (26)

not pushing to be treated in a particular way:

> *"(Pause)... I think, two year ago, when I first complained about the pain I could have been helped a little....if they send me to...the Rheumatologist the time I complained, I quite believe I wouldny be in the state I'm in the day.... Well I blame myself' for no' pushin' it. I should have pushed it"* (28)

and for refusing to have treatment:

> *"I don't think anybody else was responsible for it, no, just myself...because I wouldn't go for the operation. I could go for the operation and it would cure it (angina)"* (40)

The second theme, "Inappropriate Activity", involved six different types of response. The first, "Choosing lifestyle", involved attributions to the self for maintaining unhealthy behaviours:

> *"I believe that I was indirectly responsible...because I do believe that it was lifestyle, em wrong eating habits, combined with the stress of raising a family and doing a very heavy full-time job"* (20)

> *"Yes I think I'm fifty percent responsible for the pain, for the way I lived. My lifestyle. Likes if I hadn't have smoked and been up 'till all hours, only getting four hours' sleep sometimes. I think all these things contributed"* (40)

The second response, "Employment" involved participants making attributions to themselves for having chosen the job in the first place:

> *"I don't think I could hold anyone responsible, to be quite honest. It's a personal choice I made...the type of job"* (53)

for working too hard in the job:

> *"Myself...I just worked too long, working lifting heavy stuff for (removal firm) and instead of leaving there I just kept on going because I had to work sometimes buses, sometimes (removal firm), sometimes doing other things, you know. Only for the sake of keeping such a big family"* (14)
>
> *"Yes, myself (sighs). Em, I'm a workaholic, push myself to the limits, not just occasionally, every day, before even this (condition) was diagnosed I was pushing myself far too hard. Em putting myself through pain barriers, when I was in pain. Not stopping, not considering anybody, just going through it"* (43)

and not following proper procedures at work, leading to pain:

> *"....In the case of me working in hospital there were facilities there which helped you lift heavy patients. It was not always practical. But senior staff*

> *there would insist that we use ambulifts to get heavy patients in the bath, and took a dim view of a nurse lifting a patient without that help. But rules are there to be broken, which I did...I blame myself"* (18)

The third type of response, "Lifting and handling", involved participants who had experienced pain for a short time, i.e. for up to one month's duration, reporting having experienced sudden strain through carrying or moving heavy objects, such as a washing machine, heavy bag, or a caravan:

> *"(Pause). Em, my behaviour, in the sense of....carrying stuff that's too heavy, and just on one side of my body"* (62)
>
> *"...Just masel, just masel really. It must have been masel that's.....movin' what I did (a caravan), it must just have been rough to do it"* (38)

The fourth type of response, "Sport", was male-dominated, and involved participants making attributions to their sporting activities for their pain onset. These activities were related to the conditions experienced. One participant was suffering from plantar fasciaitis (pain in the heels), and reported that his golfing activities (requiring him to spend long periods of time on his feet), led to his pain. Another participant made attributions to rugby for his rheumatoid arthritis:

> *"Myself...mainly because the...playing sports as em as intensely as I did, em, and playing rugby with damage to the knees when it would have been more judicious to rest them. But as I was a lot younger I didn't appreciate that. And*

> *that really was the thin end of the wedge, and the damage has accumulated over twenty five years of playing rugby...* " (13)

The last two types of response were single attributions made for back pain to inappropriate "Stretching" and "Posture".

The third theme to emerge was "Pain Triggers", and involved attributions to the self for pain having not resolved at the time of interview. This consisted of reports of "Activities" carried out that trigger bouts of pain. Some of these were unintentional:

> *"...I think because I personally have been unable to rule out every single trigger of migraine em I think there's a bit of self-blame in that respect. I feel it's always a situation that I have allowed myself to be in that's brought on the headache"* (30)

Others were intentional, in the sense that participants carried out activities knowing they would lead to pain, but doing this either because they refuse to let pain interfere in their lives:

> *"Myself, 'cause I can sit down, and give in to it, an' I refuse to become a vegetable, even though at times I suffer. But I push it to its limits still"* (33)

or because they are worried about university coursework:

> *"....I suppose me, it's, it was, yeah... because of the way that I've not been taking care of myself the way that I've been, you know things that would put*

> *strain on me physically...em ..I've been worried about my dissertation and I've been told not to use a PC but I have twice..."* (62)

5.2.6 Category 4: Attributions to Others

Chapter 4 (section 4.5.2.3) defined "Attributions to Others" as any attributions made by the participants to other people for their pain. This category was developed from four common themes to emerge from the pain attributions made. The first, "Family", involved females making attributions to their "Husband", who it was felt created stress, leading to pain:

> *"Yes, I..think my husband could be accountable, for the way he treated me"* (37)
>
> *"....I blame my husband...em, being self-employed, a shopkeeper...my husband doesn't work with me in the shop. He has another business and he didn't actually see, what was being done. He was aware of what money was coming in, but he didn't actually know what was involved in this....and it was really quite, very tiring. And I think that was what brought everything to a head"* (43)

The second theme, "Outsiders", involved attributions to people not well known to the pain sufferers. This was characterised by attributions to "Drivers", "Offenders", and "Patients". Attributions to "Drivers", were made by participants who had largely suffered from upper body pain (neck, shoulder pain), for up to five months' duration, and involved attributions to the driver of a speedboat for speeding, resulting in a person falling out a rubber tyre being towed by the boat:

> *"The driver of the speedboat...I was in a doughnut, being towed by a speedboat, and eh the driver was going too fast and went to turn and positioned the boat into a corner, and the doughnut was pulled behind it in a sharp angle at great speed, and I was thrown from the doughnut by the G-force and hit the water and hurt my shoulder"* (42)

to other people driving recklessly and crashing into the participants' vehicles:

> *"....and just out of the blue this car came towards us on the wrong side of the road, overtaking a car which was goin' slow, and he accelerated into us. And I took, as the driver I took the brunt o' the crash, which was a head-on crash...an' I feel no bitterness to the driver, at all, which I find hard to understand mysel', but I feel no bitterness towards him he was a young guy. Thirty-six (pause). ..But he caused it, he caused it. He caused the pain wi' his bad drivin' no' thinkin', being completely stupid, but eh (pause). I dinny feel any bitterness towards him..."* (21)

and to the driver of a vehicle that knocked a participant over, leading to court action:

> *"It was the driver...If it was in court it would be between in my opinion, and this is only my opinion, between the driver of the vehicle I was with, and the driver that was driving the vehicle that knocked me down"* (7)

Although this participant was suing for his injuries sustained after being knocked over, neither this not any of the other attributions made involved any reported negative feelings towards the drivers of vehicles who caused harm.

One attribution to an "Offender" was made by a former police officer who reported being attacked while trying to arrest someone:

> *"The person who assaulted me is, responsible for the pain that I have. He had the choice to stop his actions and had it just been a straightforward wrestling match that would have been fair enough, and had he acted responsibly, he possibly would have given himself up....but when you reach the point where you're on the ground wrestling wi' somebody and they, at that point, pull a knife on you, and are intent on burying the knife into you, they are wholly responsible"* (54)

Attributions to "Patients" were made by females who had worked in a nursing care environment, and reported being injured by patients through getting into struggles with them:

> *"Patients. Well it was actually lifting patients and them not operating and twisting and fighting that caused one of the pains. Another one was trying to support a lady who was determine to go sideways onto a bed and would have ripped her leg at the corner of the cotside, and I was pulling against her trying to stop her from hurting herself"* (1)

This person went on to attribute responsibility to the patients:

> *"...patients, because in years gone by they couldn't be held accountable psychiatric patients, for anything that happened. But in the say last ten or twelve years or so I couldn't say for definite, you can actually sue them in a court of law for the injuries caused to you, even though they're mentally ill"* (1)

This attribution presents the opposite view to that of a nurse who said of a 17-year-old patient who attacked her:

> *"...I don't really blame her because I mean she didn't really understand what she was doing"* (45)

One other former nurse also reported being attacked by a patient:

> *"It was a patient who was delirious, and who had a plaster cast on his leg who kicked me"* (19)

The third theme to emerge, "Employers", included those former nurses who made attributions to "Patients", also making attributions to their "Bosses". These attributions were made to senior staff for failing to deal appropriately with patients in the first place, to help avoid injury:

> *"...the consultant who put her into my ward when she should have been in a locked ward environment"* (45)

> *"I still think that if the patient had been treated...his condition wouldn't have developed, and the injury wouldn't have occurred...The medical staff (were responsible)"* (19)

and to employers for their failure to get their employees properly treated once the injury had occurred:

> *"When the accident happened, and I was having treatments from doctors and it was logged in accident reports and everything, I feel that my employing body could have done more about it at the time, and managed to get me physiotherapy, or whatever was necessary at the time to alleviate the ongoing pain"* (1)

Responses to "Company" also fell under the "Employers" theme, where people made attributions for their pain to a body of people working in the same institution. This included a ladder company for a person falling off a ladder injuring her wrist, a company in whose store someone slipped on potatoe brie, falling over and injuring his back, and the Council:

> *"The Council for not salting the pavement , which I slipped on...I had a fall, and em slid on the ice on the pavement"* (56)

The fourth theme to emerge was "Scientists", involving attributions to "Medical Professionals". Many participants made attributions to a range of medical professionals for their pain condition, involving General Practitioners, surgeons, and physiotherapists. A few attributions were made to medical professionals for the pain onset, including to a doctor for the nature of the delivery of a child which led to the development of interstitial cystitis:

> *"The doctor that delivered my son. Without a doubt....She caused the damage. An' its progressively got worse since then"* (34)

An attribution was also made to a surgeon for a failed operation to treat another condition, which subsequently led to the development of adhesions associated with the current pain condition. However, unlike other participants making attributions to medical professionals, this participant was informed that a surgeon was the source of her pain:

> *"The back pain would be the first surgeon I had. Em, the first four, five times he went in (the back), it was an older surgeon, and he didn't know what he was looking for. And he just kept opening me up, which started off the adhesions an' that, and when my next surgeon came, from Glasgow, eh he told me and my husband that it was through him, opening me up these many times that started the bad adhesions..."* (15)

Additionally, there was a report that through the misdiagnosis of a condition, a physiotherapist advised the wrong treatment, compounding the existing pain problem:

> *.....at the beginnin', I still blame the physiotherapist because she made the wrong diagnosis. It's a mistake she shouldn't have made"* (58)

Despite these reports of negligence, no bad feelings towards medical professionals were reported at interview, and one participant, who attributed her osteoarthritis to her childhood doctor for failing to diagnose her with dislocated hips as a child sounded almost remorseful at making this attribution:

> *"I think I'll just need to go back and blame this poor wee doctor. He just didn't, have a clue what was wrong, so he just shrugged it off"* (24)

Many more attributions were made to medical professionals for the pain having not resolved at the time of interview, than for the pain onset. Similar attributions to those for the pain onset were made, although on a larger scale. In particular, attributions to surgeons for failed operations to treat an existing pain problem were commonly reported. For example:

> *"I think it's being truthful, I think it's (Dr X) orthopaedic surgeon who went into my spine. Because I honestly think he was awfy good wi' hips and knees an a' that, but I dinny think he should have gone into my spine. I think he, he felt that he had, he was able to operate at levels that was really a bluff"* (17)

This participant also reported that she was unsure about having the operation in the first place, but felt pressurised into having it:

> *"...It's the whole medical profession together saying, "You should go an' do this. One part of the medical profession is saying, "No you shouldn't", but your GP and your consultant surgeon are saying, "Yes". So at that stage if I had said, "No, I'm no' gonnie have this operation", they would have said,*

> *"Well go ahead an' live wi' this pain". So you wouldny have the backing of them after that, you know you were taking their advice. It was different after the operation when I still had the pain, then they couldn't do enough for me"* (17)

Related to this uncertainty about having surgery, one participant reported that he wished he had sought a second opinion on his back condition before going ahead with surgery that made his pain worse:

> *"Well, eh, I don't want to put blame on (Dr X), but I wish I'd got a second opinion for the neurosurgeon....I wish I'd have got a second opinion rather than goin' ahead and gettin' the operation, the, for the first time..."* (23)

Additionally, one participant reported that she started to sue her surgeon after an operation to remove her gall bladder made her pain worse. She was also convinced that people other than the surgeon took part in her operation:

> *"....I wouldn't go to the point of suing my doctor unless I thought he was in some way responsible. I felt he was, he was responsible, not for the onset, but for making it worse. I'm sure, in fact, at the time I'm sure it was his assistant who did the operation...She was a young girl...She was never away from my bed. I'd to get a lot of blood transfusions because I'd lost a lot of blood....And I have the feeling although it was never ever mentioned, that she got to do the operation...no one will ever admit that, she was getting a shot a poking in"* (27)

This participant went on to report that she requested further exploration of her pain, but was refused this:

> *"I feel they could have done something for me, even an exploratory operation which I have asked for, and I have been told that it (the pain) would be made worse. How they know that is something I can never understand"* (27)

In addition to surgeons, attributions were also made to doctors, for reasons involving the misdiagnosis of a condition:

> *"(Sighs). The first clinic I was sent to, I was misdiagnosed for almost a year...The first diagnosis I was given at the (clinic) was that it was a typical frozen shoulder, despite the physiotherapist going to (Dr X), arguing in from of me that the physiotherapist said it was not typical. And the doctor said yes it was because it was an easier diagnosis to make.."* (19)

and for treating only the symptoms of a condition, not the cause of it:

> *"Possibly doctors...Because when one goes to the doctor and you say you've got a sore back, the doctor says, "Here's a painkiller". You go back three months later, you get another set of painkillers. Possibly if you'd been x-rayed earlier they might have noticed there was something wrong with the spine"* (26)

This participant went on to report that after unsuccessful treatment of his back pain from a doctor, he paid to attend a chiropractor to have his condition treated:

> *"...chiropractor was the first person who sent me for an x-ray, and he seemed to me, he seemed to see what was wrong, and he has treated me for that"* (26)

An attribution was also made to a doctor for failing to treat an infection, leading to the development of arthritis:

> *"I believe it's the doctor's fault for not curing that viral infection in the first place"* (10)

and for not treating a condition fast enough, leading to inactivity which resulted in back pain:

> *"Sometimes I blame the doctors because a year-and-a-half ago, in fact three years ago I had this pain under the ribcage, and nothing really seemed to get done about it...(had gall bladder out). The back bone, I mean it was always just a wee bit throbbin' but because I've no' been working I feel this is where this has all set in. And I feel that in a lot of ways it is the doctor's fault"* (2)

One single response also fell under this theme, "Researchers", where an attribution was made to researchers for failing to find a cure for arthritis, and used as an explanation why the condition remained at the time of interview:

> *"...I would say researchers because they haven't come up with a good enough em....aye, they've no' come up with a cure yet, or a way of coping with it "* (9)

5.2.7 Summary

This section presented the qualitative results of the themes and categories to emerge from the responses to the attribution interview questions. The category "Physical Internal Attributions" was characterised by responses that internal states were the source of pain. Three themes emerged within this category, firstly "Condition Specific", involving attributions both to the symptoms and name of a condition. Closer analyses suggested that pain duration might influence which of these types of response is given. In particular, people with longer pain durations might make attributions to their symptoms, while those with shorter durations might make attributions to the name of their condition. The second theme, "Genetic", involved attributions made to heredity factors, while the third theme, "Biology", involved attributions to height and age factors.

The second category, "Physical External Attributions", was characterised by factors occurring outwith the body, in the environment. Three themes emerged from the responses within this category. The first theme, "Incidents/Accidents" involved attributions made to various types of accidental falls, and incidents involving straining activity. The second theme, "Lifestyle", involved different lifestyle factors leading to pain, such as the nature of employment, involving strenuous labour, way of life, involving unhealthy behaviours such as smoking and poor diet, and leisure activities, such as gardening. The third theme, "Initiator/Consequence", largely involved attributions to various types of medical treatments, including oral medications, surgical treatments, and physiotherapy, that either led to the development of pain, or made it worse.

The third category, "Attributions to the Self", involved any attributions for pain that involved the participants themselves. Three themes emerged from these attributions. The first, "Omissions", was characterised by responses that pain resulted from or was made worse by a failure to do certain things, either a failure to obtain treatment at the onset of a condition, or since its onset, a failure to look after the self properly, for example through pushing the self to work too hard, and a failure to avoid or notice potential hazards that caused harm. The second theme, "Inappropriate Activity", involved attributions to the self for carrying out activities that caused harm, including unhealthy behaviours such as smoking, sporting activities, stretching too much, poor posture, carrying out inappropriate behaviour or pushing oneself too hard within employment, and lifting and handling objects awkwardly. The third theme, "Pain Triggers" was exclusive to the pain having not resolved at the time of interview, and involved both intentional and unintentional activities that induce an episode of pain.

The fourth category, "Attributions to Others", involved any attributions made for pain that involved other people. Four themes emerged from these responses, including firstly, "Family", where attributions were made to husbands for inducing stress that led to pain. Secondly, "Outsiders", involving attributions to people not known to the participants, either drivers of vehicles who knocked the participants over or crashed into their car, an offender who resisted arrest, and patients who either attacked or struggled with the participants, causing injury. The third theme, "Employers", was characterised by reports of the negligence of bosses resulting in the participants' pain, or companies being held accountable for injuries sustained by participants. The fourth theme, "Scientists", largely involved attributions to medical professionals for the pain onset and/or the pain having not resolved at the time of interview. These attributions involved General Practitioners, surgeons and physiotherapists, and were made for the failure to diagnose a problem, the misdiagnosis of a problem, or for a delay in treatment or the wrong treatment administered, leading to a worsening of a condition. Within this theme one attribution was also made to researchers for failing to devise a cure for arthritis.

5.3 QUANTITATIVE RESULTS

5.3.1 Attributions

5.3.1.1 Introduction

The first aim of the study was to examine the cause, responsibility and blame attributions made for pain. There were four parts to this (Chapter 3, section 3.3.1), each of which will be considered in turn. Following this, individual differences in the attributions made will be investigated, and the section summarised.

5.3.1.2 The Making of Attributions

The extent to which cause, responsibility and blame were attributed for the pain onset and pain now, is summarised in Table 5.1.

Table 5.1: The making of attributions for the pain onset and now

Attribution	Yes		No		Missing		Total	
	N	%	N	%	N	%	N	%
Onset								
Cause	56	90.3	6	09.7	0	0.0	62	100
Responsibility	35	56.4	27	43.5	0	0.0	62	100
Blame	27	43.5	34	54.8	1	1.6	62	100
Now								
Cause	48	77.4	13	21.0	1	1.6	62	100
Responsibility	34	54.8	27	43.5	1	1.6	62	100
Blame	25	40.3	34	54.8	3	4.8	62	100

Most participants made causal attributions for their pain onset (90.3%), and now (77.4%) (Table 5.1). Those who did not make causal attributions for the onset reported they did not know the cause of their pain. This was also the case for the pain now, with the additional response that the pain is "just there". Fewer responsibility and blame attributions were made. Only 54.6% of the sample attributed responsibility for the onset and 54.8% for the pain now. Similarly, only 43.5% of the sample attributed blame for the onset, and 40.3% for now. These low percentages are due to the high numbers of participants who did not make these attributions. Indeed, around one-quarter of the sample (27.4%), made no responsibility or blame attributions at all (not tabulated).

5.3.1.3 The Nature of the Attributions Made

Section 5.2 identified four main categories of response across cause, responsibility and blame questions. These were attributions to "Physical External" factors, "Physical Internal" factors, the "Self", and "Others". Table 5.2 summarises the incidence of these responses. The data is based on the number of participants who made attributions for each time period (see Table 5.1). However, in general the numbers of participants exceed those in Table 5.1, due to multiple responses. For example, one person may have attributed a cause for his/her pain onset within both the "Physical External" and "Physical Internal" categories.

Table 5.2: Number of people who made each type of response across cause, responsibility and blame for the pain onset and now

Attribution Type	Physical External	Physical Internal	The self	Other People	*Other Responses
	N	N	N	N	N
Onset					
Cause	28	16	3	10	6
Responsibility	6	6	17	13	3
Blame	4	1	12	12	1
Now					
Cause	13	11	9	15	2
Responsibility	7	0	16	13	2
Blame	2	0	8	14	4

* Lesser frequent categories e.g. psychological factors, God, something

The fact that responses to cause, responsibility and blame questions fell within these four categories, led to the question of whether or not the concepts were distinguished from each other. This was investigated on both a descriptive and statistical level.

5.3.1.4 Distinctions Between Cause, Responsibility and Blame

Descriptive distinctions were based on distinctions between pairs of concepts for each time period. For example comparisons were made between the cause and responsibility attributions made by each of the 62 participants for the pain onset and now, respectively. As such, it was possible to distinguish between each pair 124 times. Table 5.3 summarises the results.

Table 5.3: The incidence of cause, responsibility and blame being distinguished from each other

Attribution pairs	Distinguished		Not Distinguished		Missing Responses		Total	
	N	%	N	%	N	%	N	%
Cause/responsibility	84	67.7	38	30.6	2	1.6	124	100
Cause/blame	90	72.6	29	23.4	5	4.0	124	100
Responsibility/blame	32	25.8	87	70.2	5	4.0	124	100

Only 25.8% of the responsibility and blame attributions were distinguished from each other (see Table 5.3). This is because they were largely similar, in terms of the number and nature of attributions made. In terms of their number, 17 participants (27% of the sample) did not attribute responsibility or blame at all. In terms of their nature, responses to both largely fell within the "Self" and "Other" categories (see Table 5.2). Both factors created similar patterns of response between responsibility and blame.

The causal attributions made were largely distinguishable from the responsibility (67.7%) and blame (72.6%) attributions (see Table 5.3). Distinctions again were made on the basis of the number and nature of the attributions made. Many more cause than responsibility or blame attributions were made for both time periods, as indicated in Table 5.1. Additionally, although all four categories emerged across all three attribution types, responses falling within the "Physical External" and "Internal" categories were made much more frequently as causal attributions, as indicated in Table 5.2.

Responses falling within the "Self" and "Others" categories were more evenly spread across all three attribution types (see Table 5.2). This led to a statistical investigation of the extent to which the concepts were associated with each other on the basis of these attributions. The aim of this was to determine whether or not the concepts were so closely related so as to be indistinguishable from each other. Chi-square analyses revealed the following associations between pairs of attribution concepts, for both the pain onset and now.

Table 5.4: Associations between attribution concepts

Variable	X^2	df	Cramer's V
Self			
<u>Onset</u>			
Cause/responsibility	4.95*	1	0.37**
Cause/blame	1.84 (N/S)	1	0.27*
Responsibility/blame	13.72***	1	0.52***
<u>Now</u>			
Cause/responsibility	19.22***	1	0.62***
Cause/blame	11.75***	1	0.52***
Responsibility/blame	20.32***	1	0.65***
Other people			
<u>Onset</u>			
Cause/responsibility	29.50***	1	0.74***
Cause/blame	23.17***	1	0.67***
Responsibility/blame	21.85***	1	0.65***
<u>Now</u>			
Cause/responsibility	27.53***	1	0.72***
Cause/blame	13.48***	1	0.53***
Responsibility/blame	33.17***	1	0.81***

*p<0.05, **p<0.005, ***p<0.001

Considering the results of Table 5.4 as a whole, associations were found between cause, responsibility and blame. The strength of these associations varied from 0.27-0.81. This is similar to the correlational values reported between the attribution concepts in other, experimental research. Critchlow (1985), and Mantler et al (2003) reported such correlational values to represent the conceptual closeness of the concepts, whilst remaining distinct. In support of this, overall slightly stronger associations were found between cause and responsibility, and responsibility and blame, than cause and blame. This may be attributable to the fact that in Shaver's (1985) Theory of Blame Assignment (Chapter 2, section 2.2.3.3), although attributing cause is a requirement for blame attributions to be made, both are conceptually closer to responsibility than each other.

The fact that associations were found between the categories "Self" and "Others" across cause, responsibility and blame, for both times periods, led to a principal components factor analysis being carried out as a means of identifying similar patterns across the data. Three factors emerged with eigenvalues greater than one, accounting for 69.7% of the total variance. Table 5.5 shows the factor loadings that had been subjected to varimax rotation, along with the communalities.

Table 5.5: Varimax factor analysis of 12 items relating to attribution response (2) x attribution type (3) x both time periods (2) (N = 43, the number of participants who made attributions to the self and/or others)

Variable	Factor 1	Factor 2	Factor 3	Communality
Others cause of onset	/	.882	/	.827
The self cause of onset	.581	/	/	.389
Others cause now	/	/	.822	.750
The self cause now	.806	/	/	.669
Others responsible onset	/	.831	/	.770
The self responsible onset	.775	/	/	.621
Others responsible now	/	/	.822	.850
The self responsible now	.843	/	/	.802
Others blame onset	/	.774	/	.750
The self blame onset	.706	/	/	.565
Others blame now	/	/	.669	.743
The self blame now	.717	/	/	.628
Eigenvalue	4.74	2.87	1.01	
% variance	37.3	23.9	8.5	

A cut-off point of 0.5 was used for the inclusion of loadings in the interpretation of the factors (Comrey, 1978). Each variable loaded on only one factor and no variable failed to load on any factor. The first factor, accounting for 37.3% of the variance attracted high positive loadings from the category "Self", across all three attribution types, for both time periods. It was named, "Attributions to the self". Factor 2 accounted for 23.9% of the variance, and attracted loadings from the category "Others" for the pain onset, for all three attribution types. This was named, "Attributions to others for the pain onset". The third factor accounted for 8.5% of the variance, and attracted high loadings from the category "Others" for the pain now, for all three attribution types, and so was called, "Attributions to others for the pain now". Combined, the items in each factor produced a Cronbach's alpha coefficient score of 0.71. These factor scores were retained for further analysis.

The finding that attributions for both the pain onset and now fell under the same factor for the category "Self" but loaded on separate factors for the category "Others", can be explained by the nature of the responses that fell under both categories. This will be considered in the next section, on the extent to which attribution responses changed over time.

5.3.1.5 Changes in Pain Attributions

The original aim of this analysis was to consider the extent to which individually, cause, responsibility and blame changed for different times in the pain experience. However, this analysis was compromised by finding that there was a lack of responsibility and blame attributions being made for both times (see Table 5.1). This, combined with the fact that similar responses were given across all three attribution types, and all three attribution types loaded on the same factors for the categories "Self" and "Others", led instead to an investigation of the extent to which attribution responses changed over time.

This analysis quantifies the nature of the attributions made within each of "Physical External", "Physical Internal", "Self", and "Others" categories discussed in section 5.2. For each table of results in this analysis, N represents the summed number of responses for each category in Table 5.2.

Table 5.6 summarises the attribution responses within the category "Self".

Table 5.6: Pain attributions within the category "Self"

Response	Onset		Now	
	N	%	N	%
Choosing lifestyle	6	18.8	4	12.1
Lifting and handling	5	15.6	4	12.1
Hazard avoidance	5	15.6	2	06.1
Not looking after the self	4	12.5	2	06.1
Employment	4	12.5	4	12.1
Sport	3	09.4	0	0.00
Stretching	1	03.1	0	0.00
Posture	1	03.1	0	0.00
Activity	0	00.0	6	18.2
Failure to obtain treatment	0	00.0	3	09.1
Unstated origin of self-attribution	3	09.4	8	24.2
Total responses	32	100	33	100

As can be seen in Table 5.6, similar types of attributions were reported for both the pain onset and now. This was also the case for the nature of the responses within the "Physical External", and "Physical Internal" attribution categories, as can be seen in Tables 5.7, and 5.8.

Table 5.7: Pain attributions within the category "Physical External Attributions"

Response	Onset		Now	
	N	%	N	%
Falling	10	26.3	4	18.2
Nature of employment	7	18.4	8	36.4
Medical treatment	6	15.8	7	31.8
Way of life	6	15.8	1	04.5
Straining activity	5	13.2	0	0.00
Leisure activity	4	10.5	1	04.5
The system	0	0.00	1	04.5
Total responses	38	100	22	100

Table 5.8: Pain attributions within the category "Physical Internal Attributions"

Response	Onset		Now	
	N	%	N	%
Hereditary	9	39.1	0	0.00
Symptoms of condition	7	30.4	5	45.4
Named condition	5	21.7	4	36.4
Height	2	8.70	0	09.1
Age	0	0.00	1	09.1
Post-operation stress	0	0.00	1	09.1
Total responses	23	100	11	100

Although, as Tables 5.7 and 5.8 indicate, fewer responses within the "Physical External" and "Physical Internal" categories were made for the pain now than the pain onset, those responses which were made for the pain now were to the same factors as the pain onset. As with responses within the "Self" category, this suggests that both time periods were not distinguished from each other. Statistically significant associations between both time periods supported this idea within the categories "Self" (X^2, 21.71, df = 1, p<0.001), and "Physical External Attributions" (X^2, 3.28; df

= 1; p<0.05), but not "Physical Internal Attributions" (X^2, 1.29, df = 1, p = N/S). This is likely to be due to the fact that there were less than half the number of responses within this category for the pain now than the pain onset. Despite this, overall the descriptive and statistical associations between the pain onset and now indicate that both time periods were not distinguished from each other. This could explain why both time periods loaded on the factor "Attributions to the Self" (see section 5.2.4.3).

Table 5.9 summarises the attribution responses within the category, "Others".

Table 5.9: Pain attributions within the category "Others"

Response	Onset	Now	
	N*	N	%
Drivers	11	9	20.9
Medical professionals	8	19	44.2
Patients	8	5	11.6
Offenders	1	0	0.00
Bosses	6	1	02.3
Company	5	7	16.3
Husband	1	1	02.3
Researchers	0	1	02.3
Total responses	40	43	100

*N> the number of participants who made attributions to others in Table 5.2 because a few participants made attributions to more than one other person.

As with the nature of the attribution responses in the other categories, similar types of attributions were made for the pain onset and now within the category "Others", and both time periods were statistically related (X^2, 11.58, df = 1, p<0.001), again suggesting they were not distinguished from each other. However, nearly half of the attribution responses made to others for the pain now were to medical professionals, and the majority of these were for things which had happened in the time between the pain onset, and the present time. This indicates that there was some change in the attributions made, perhaps explaining why responses within the category "Others" fell under separate factors, for the pain onset, and now (see section 5.3.1.4).

5.3.1.6 Motives for Making Causal Attributions

Chi-square analyses to determine relationships between making attributions for the pain now (combined causal responses), and knowledge and uncertainty factors, were non-significant (not tabulated). This suggests that causal attributions were not associated with possible motives for making them.

5.3.1.7 Individual Differences in Pain Attributions

Chi-square analyses were conducted to determine any pain and demographic-related differences in the attributions made. In order to do this, some continuous data was collapsed into groups. In particular, pain duration was split into three groups using percentile ranges to form short (1 month - 2.5 years), medium (3 – 9 years), and long (9.5+ years) pain duration groups. Using the same criteria, age was also split into younger (18 – 43 years), middle-aged (44 – 59 years) and older (60+ years) age groups. Table 5.10 summarises the nature of the individual differences found. For each difference, the table produces significance levels, indicates where within each group the differences lie, and provides information on the extent to which the subgroups within each group reported and did not give responses within each type of attribution category.

Table 5.10: Individual differences in pain attributions

Individual Difference	Attribution Type			
Type of pain	**Others onset (combined)****		**Others responsible now**	
	Report (%)	None (%)	Report (%)	None (%)
Back/spinal	31.3	28.9	23.1	31.3
Arthritis	06.3	33.3	07.7	33.3
Upper body	43.8*	15.6*	38.5	18.8
Middle body	18.8	11.1	30.8*	06.3*
Lower body	0.0	11.1	0.0	10.4
Total	100	100	100	100
Statistical significance	**X^2, 0.04, df = 4, $p<0.05$**		**X^2, 0.03, df = 4, $p<0.05$**	
***Statistical difference**	**X^2, 4.0, df = 1, $p = 0.05$**		**X^2, 5.30, df = 1, $p<0.05$**	
Pain Duration	***Just there (cause of pain now)***			
	Report (%)	None (%)		
1 month–2.5 years	07.7	39.6		
3-9 years	23.1	37.5		
9.5+ years	69.2*	22.9*		
Total	100	100		
Statistical significance	**X^2, 10.48, df = 2, $p<0.05$**			
***Statistical difference**	**X^2, 6.54, df = 1, $p<0.05$**			
Gender	**Self onset (combined)**			
	Report (%)	None (%)		
Male	50.0	22.0		
Female	50.0	78.0		
Total	100	100		
Statistical significance	**X^2, 3.71, df = 1, $p = 0.05$**			
Statistical difference	**N/S**			
Age	**Others onset (combined)**		**Self now (combined)**	
	Report (%)	None (%)	Report (%)	None (%)
18-43 years	56.3	26.7	18.8	41.5
44-59 years	37.5	37.8	62.5*	26.8*
60+ years	06.3*	35.6*	18.8	31.7
Total	100	100	100	100
Statistical significance	**X^2, 6.64, df = 2, $p<0.05$**		**X^2, 6.35, df = 2, $p<0.05$**	
***Statistical difference**	**X^2, 3.7, df = 1, $p = 0.05$**		**X^2, 3.96, df = 1, $p=0.05$**	
Employment status	**Self onset (combined)**		**Self now (combined)**	
	Report (%)	None (%)	Report (%)	None (%)
Employed	55.0*	24.4*	62.5*	24.4*
Retired	30.0	36.6	18.8	41.5
Student	15.0	12.2	18.8	12.2
None	0.0	26.8	0.0	22.0
Total	100	100	100	100
Statistical significance	**X^2, 9.27, df = 3, $p<0.05$**		**X^2, 10.32, df = 3, $p<0.05$**	
***Statistical difference**	**X^2, 3.63, df = 1, $p=0.06$**		**X^2, 4.80, df = 1, $p<0.05$**	

**Refers to responses combined across cause, responsibility and blame attributions

As can be seen from Table 5.10, differences in the attributions made were found across a range of individual difference variables, and were largely concerned with the categories "Self" and "Others". In terms of pain-related variables those with upper body pain (e.g. head, neck, shoulder), were more likely than the other types of pain groups to make attributions to other people for their pain. This involved making these attributions (across attribution types) for the pain onset (43.8%), and reporting others responsible for their pain now (38.5%). Additionally, those with the longest pain duration (9.5+ years) were more likely than the other pain duration groups to refrain from making causal attributions for their pain now, instead reporting their pain to be "just there" (69.2%).

In terms of the other individual difference variables, those in the youngest age group (18 - 43 years) were more likely than those in the other age groups to make attributions to others (across attribution types) for their pain onset (56.3%). Those in the middle age group (44 - 59 years) were more likely than the other age groups to make attributions to themselves (across attribution types) for their pain now (62.5%). Additionally, those who were employed were more likely than those in the other employment status categories to make attributions to themselves (across attribution types) for both their pain onset (55.0%) and now (62.5%).

5.3.1.8 Summary

One aim of the present study was to examine the cause, responsibility and blame attributions made for pain. In terms of the making of attributions, the results indicated that the majority of the pain sufferers made causal attributions for both their pain onset (90.3%) and now (77.4%). Fewer responsibility and blame attributions were made for both times. Around half of the sample attributed responsibility for their pain (54.6% for the pain onset, and 54.8% for now), with just under half attributing blame (43.5% for the pain onset, and 40.3% for now).

Four attribution categories emerged across cause, responsibility and blame. These involved attributions to "Physical External", "Physical Internal", "Self" and "Other" factors. Although common across all three concepts, responses within the "Physical External" and "Physical Internal" categories were more common as causal attributions, and there was a slight tendency for attribution responses within the "Self" and "Others" categories to be made more commonly as responsibility and blame attributions.

This difference in the distribution of attribution responses across all three concepts, combined with the number of people who made each type of attribution for each time period, formed the basis of descriptive distinctions between cause, responsibility and blame. The led to the conclusion that the pain sufferers in the present study distinguished causal attributions from responsibility and blame attributions, but not these latter two types of attributions from each other. However, on a statistical level these distinctions were not so clear-cut. Associations between the "Self" and "Others" categories revealed strong associations between all three concepts. The few available empirical interpretations of these associations are in conflict, making it impossible to draw any firm conclusions about the nature of the associations. This will be considered further in Chapter 6.

In terms of whether or not attributions changed for different times in the pain experience, descriptive and statistical analyses between types of attribution responses for the pain onset and now largely revealed that the pain sufferers did not change the attributions they made about their pain.

The final attribution finding was that in the current pain sample, knowledge and uncertainty factors held no associations with making causal attributions.

The literature reviewed in Chapter 2 discussed few individual differences in attributions made (Chapter, 2, section 2.3.4). One of the reported differences contradicted what was found in the present study. Specifically, Heinemann et al (1988) found their younger spinal injured patients attributed more responsibility for their condition to themselves. In the present study the younger pain sufferers were more likely to make attributions to others overall for their pain onset, while the middle-aged pain sufferers made more attributions to themselves overall for their pain now. These differences are likely to be a function of both the timing of the attributions, and the types of conditions experienced in both studies.

5.3.2 Adjustment

5.3.2.1 Introduction

Chapter 3 (section 3.3.2) stated the second aim of the present study was to explore various ways of adjusting to pain using health, psychological and functioning measures. This section will report the nature of the adjustment reported, along with changes in psychological adjustment, the nature of adjustment interactions, and individual differences in adjustment. The section will end with a summary of adjustment.

5.3.2.2 The Nature of and Changes in Adjustment

Table 5.11 defines the most common types of adjustment reported, that were entered into statistical analysis, and presents the number of responses given for each type of adjustment. Less common types of reported adjustment can be seen in Appendix 5.

Table 5.11: Reported types of adjustment to pain

Type of adjustment	N	Definition of common outcomes
Health		
Treatments		
Oral medications	55	
Physiotherapy	28	
Complementary treatment	19	
Surgery	12	
Self-management strategies		
Physical	32	Rest, exercise, heat,
Psychological	15	Distraction, mind-over-matter
Do what is required by health Professionals	11	Take advice of health profession
Psychological (emotions)		
Onset		
Negative emotions	43	General upset/distress; anger; fear/worry
*Positive statements	8	Felt pain would resolve; acceptance of pain
Now		
Negative emotions	37	Anger; irritation/frustration; hatred/resentment
Positive statements	24	Acceptance of pain; general positive feeling; live with it
Since		
Negative emotions	34	Depression; feeling down; fear/ worry
Positive statements	30	Coping; refuse to get down
Functioning		
Physical		
Loss of ability to carry out leisure/ social activities	33	Unable to pursue exercise/social interests e.g. sports, holidays; attend cinema
Loss of ability to carry out daily activities	19	Unable to work/do daily tasks e.g. shopping, household tasks
Methods of adaptation	19	Adapted life activities e.g. use special implements/alter activities
Social Support		
Family	33	Practical/emotional support
Friends	18	Practical/emotional support
Social life with pain		
Social activities limited	39	Physical/social limitations e.g. cannot stand long so cannot dance
Social life unaffected	18	Little social life/no interference in usual activities
Adapted social life	7	Develop alternative interests

*Positive statements rather than emotions reported

As can be seen from Table 5.11, the participants reported a range of ways they had adjusted to their pain, along with the negative impact pain had on their lives. The table also indicates a change in the number and nature of emotions reported. In particular, there were changes in the most frequent negative emotions reported towards pain for each time period, and several, non-tabulated reasons for these emotions for these emotions emerged. General upset and distress were more common at the pain onset, as the participants tried to understand what had happened to them. Irritation/frustration and hatred/resentment were more common now, due to the ongoing nature of pain, and depression and feeling down were more common since the pain onset, due to limitations imposed on life by pain. None of the differences reported were statistically significant between the negative emotions reported for the pain onset with now (X^2, 0.01, df = 1, p = 0.93), and since (X^2, 0.00, df = 1, p = 1.00), and between the negative emotions reported now with since (X^2, 2.31, df = 1, p = 0.13).

In terms of positive feelings, many more participants reported feeling positively towards their pain now and since the pain onset, than at the pain onset. Additionally, the nature of the positive statements reported changed, from believing the pain would go away at its onset, to accepting and feeling more positively towards the pain now, combined with refusing to let the pain get one down since its onset. Reasons for these feelings included accepting the pain will not resolve, complying with its limitations, and doing what one can still do, despite pain (not tabulated). As with negative emotions, no statistically significant findings emerged between the pain onset and now (X^2, 0.14, df = 1, p = 0.70), and pain onset with since (X^2, 0.11, df = 1, p = 0.74). However, there were significant differences between the number of people who reported positive statements towards their pain now, and overall since the pain onset (X^2, 4.90, df = 1, $p<0.05$).

The fact that the majority of participants reported both physical and social limitations of their pain is inconsistent with reports of half of the sample reporting feeling positively towards their pain since its onset (Table 5.11). It would be expected that reports of pain limitations would result in the vast majority of participants feeling negatively towards their pain. One explanation for this apparent inconsistency is that the adjustment outcomes are independent of each other. This will now be investigated.

5.3.2.3 The Nature of Adjustment Interactions

Chi-square analyses across each of the categories in the health, psychological and functioning domains revealed no associations between the adjustment outcomes (not tabulated). This contrasts the reported associations between psychological outcomes, and the health and functioning outcomes reported in Chapter 2 (section 2.3.4).

The fact that the adjustment outcomes were not associated with each other suggests they are independent adjustment outcomes, in that adjustment in one domain has no bearing upon adjustment in another domain. The use of independent adjustment outcomes has been criticised on the basis that they create problems in evaluating the overall adjustment of one person (Michela and Wood, 1986). However, the use of multiple independent adjustment measures was not problematic in the present study, for two reasons. Firstly, the aim was to investigate the participants' adjustment to pain on different levels, before secondly, considering their independent associations with attributions and just world beliefs. Before considering this, individual differences in adjustment outcomes will be investigated.

5.3.2.4 Individual Differences in Adjustment

Chi-square analyses were conducted to determine individual differences in both pain and demographic-related variables on the adjustment outcomes. Table 5.12 summarises the differences in adjustment within type of pain and pain duration groups. For each individual difference, the table produces significance levels, indicates where within each group the differences lie, and provides information on the extent to which the subgroups within each group reported and did not report each type of adjustment.

Table 5.12: Individual differences in adjustment between pain-related variables

Outcome	Individual difference				
	Type of pain (%)				
	Back /spinal	Arthritis	Upper body	Middle body	Lower body
HEALTH					
Treatment					
Physiotherapy					
(X^2, 13.01, df = 4)**					
Reported:	39.3	17.9	21.4	03.6*	17.9
Not reported:	20.6	35.3	23.5	20.6*	0.0
(*X^2, 3.41, df = 1, p = 0.06)					
Self-management					
Psychological					
(X^2, 12.73, df = 4)**					
Reported:	06.7	60.0*	20.0	13.3	0.0
Not Reported:	36.2	17.0*	23.4	23.4	0.0
(*X^2, 7.72, df = 1)**					
PSYCHOLOGICAL					
Pain onset					
Negative emotions					
(X^2, 14.44*, df = 4)**					
Reported:	30.2	34.9	23.3	11.6	0.0
Not reported:	26.3	10.5	21.1	15.8	26.3
(X^2 N/S)					
Pain now					
Negative emotions					
(X^2, 10.21, df = 4)**					
Reported:	32.4	13.5*	27.0	18.9	8.1
Not reported:	24.0	48.0*	16.0	04.0	8.0
(*X^2, 5.57, df = 1)**					
Positive statements					
(X^2, 9.55, df = 4 p = 0.05)					
Reported:	26.1	47.8*	17.4	08.7	0.0
Not reported:	30.8	15.4*	25.6	15.4	12.8
(*X^2, 5.57*, df = 4)**					

Table 5.12 (continued): Individual differences in adjustment between pain-related variables

Outcome	Individual difference		
	Pain duration (%)		
	1 month-2.5 years	3-9 years	9.5+ years
HEALTH			
Treatment			
Physiotherapy			
(X^2, 6.47, df = 2)**			
Reported:	50.0*	21.4	28.6
Not reported:	20.6*	44.1	35.3
(*X^2, 3.89, df = 1 p = 0.05)			
Surgery			
(X^2, 6.00, df = 2 p = 0.05)			
Reported:	33.3	08.3	58.3
Not reported	34.0	40.0	26.0
(X^2 N/S)			
PSYCHOLOGICAL			
Since pain onset			
Positive statements			
(X^2, 6.47, df = 2)**			
Reported:	20.0*	36.7	43.3
Not reported:	48.4*	32.3	19.4
(*X^2, 3.52, df = 1, p = 0.06)			

**p<0.05, ***p<0.01

Differences were found between pain-related variables, and health and psychological outcomes (Table 5.12). In terms of types of pain groups, the back/spinal pain sufferers more frequently reported the use of physiotherapy as treatment for their pain (39.3%), and more frequently reported experiencing negative emotions towards their pain now (32.4%) than the other type of pain groups. Additionally, the arthritis sufferers more frequently reported the use of psychological self-management techniques (60%), experiencing negative emotions towards their pain at its onset (34.9%), and made more positive statements towards their pain now (47.8%), than the other type of pain groups.

In terms of pain duration groups, those with the lowest pain duration (1 month - 2.5 years) more frequently reported the use of physiotherapy as treatment for their pain (50%). Those with the longest pain duration (9.5+ years) more frequently reported the use of surgery as treatment for their pain (58.3%). Additionally, this group most frequently reported positive statements towards their pain overall since its onset (43.3%).

Table 5.13 summarises the nature of the differences in adjustment between demographic groups.

Table 5.13: Demographic differences in adjustment outcomes

Outcome	Individual difference				
	Age				
	18 - 43 years	44 - 59 years	60+ years		
FUNCTIONING					
Physical					
Leisure/social activity losses					
Reported:	33.3	24.2	42.4*		
Not reported:	37.0	48.1	14.8*		
Statistical significance: X^2, 6.26, df = 2**					
***Statistical difference: X^2, 3.78, df = 1, $p = 0.05$**					
	Marital status				
	Married	Separated	Widowed	Single	Divorced
HEALTH					
Treatments					
Oral medications					
(X^2, 9.88, df = 4)**					
Reported:	58.2	03.6	07.3	16.4	14.5
Not reported:	14.3	14.3	28.6	42.9	0.0
(X^2 N/S)					
Self-management					
Psychological					
(X^2, 10.55, df = 4)**					
Reported:	53.3	20.0	06.7	13.3	06.7
Not reported:	53.2	0.0	10.6	21.3	14.9
(X^2 N/S)					

**$p<0.05$

There were differences in adjustment outcomes within the age and marital status variables (Table 5.13). In terms of age, those who were older (60+ years) more frequently reported their social/leisure activities were limited by their pain (42.4%) than the other age groups. Age-related effects have also been found on psychological adjustment. Schulz and Decker (1985) found younger spinal-injured patients to have higher levels of psychological well being than older patients. Both age effects suggest that adjustment to these conditions may become more difficult as time goes on, probably as a function of various factors interacting with age. Additionally, those who were married more frequently reported the use of oral medications (58.2%), and psychological techniques to self-manage their pain (53.3%), than those in the other marital status groups.

5.3.2.5 Summary

In summary, a range of ways of adjusting to pain in terms of health, psychological and functioning outcomes were reported. The participants reported receiving or having received various medical treatments, specifically oral medications, physiotherapy, complementary treatment, and surgery. Additionally, two main self-management strategies were reported, namely physical strategies, involving the use of rest, exercise and heat treatments to manage pain, and psychological strategies, including distraction and mind-over-matter techniques. Various positive statements and negative emotions were reported towards pain, and the nature and number of these emotions changed for different times in the pain experience, although these differences were largely statistically non-significant. In terms of functioning, most participants reported being limited in their daily and social activities by their pain, rather than reporting ways they had adapted to their pain, although there were some reports both of adapting to achieve activities around pain, and that pain did not interfere in one's life.

The fact that there were reports of positive adjustment in some domains but not others led to an investigation of associations between adjustment outcomes. Few were found, suggesting that the health, psychological and functioning outcomes were independent of each other. Individual differences in adjustment were found between some pain and demographic-related variables.

5.3.3 Interactions Between Attributions and Adjustment

5.3.3.1 Introduction

The third aim of the study was to investigate the nature of the relationship between cause, responsibility and blame attributions, and adjustment to pain, in terms of the outcomes covered in section 5.3.2. There were five parts to this (Chapter 3, section 3.3.3), each of which will be considered in turn, before the section is summarised.

5.3.3.2 Differences in Adjustment Between Making/Not Making Causal Attributions

Logistic regression analyses were conducted to determine whether making causal attributions for the pain now predicted more adjustment outcomes than not making causal attributions, to establish any differences between both groups. All analyses between these independent variables and each of the health, psychological and functioning dependent variables (see Table 5.11), were non-significant (not tabulated). This suggests that neither making attributions as a whole, nor refraining from making them, predicted any of the adjustment outcomes, indicating they did not differ in their ability to predict adjustment.

5.3.3.3 Type 1 error

Many chi-square tests were conducted to explore associations between pairs of attribution and adjustment variables, in addition to determining any subgroup effects within these associations. As such, the results produced might be prone to a Type I error. This was controlled for as far as possible by setting a 0.05 significance level, below which results were considered to be significant, and around which results were considered to be approaching significance. In terms of subgroup effects, only those consistently occurring effects were reported, because they may be less prone to a Type I error than more random effects. However, on occasion interesting random effects emerged, and were reported.

5.3.3.4 The Causal Attribution/Adjustment Relationship

Chi-square analyses to determine whether the common causal attribution categories, "Physical External" and "Physical Internal" attributions were associated with adjustment produced few associations. Table 5.14 summarises those that were found.

Table 5.14: Associations between causal attributions and adjustment outcomes

Associations	X^2	df	Cramer's *V*
Health outcomes			
Physiotherapy			
Physical internal attributions (onset)	7.60*	1	0.39*
Psychological outcomes			
Negative emotions (onset)			
Physical external attributions (onset)	N/S		0.24**
Functioning			
Social support:			
Support from family			
Physical internal attributions (now)	N/S		0.25*
Social life:			
Social life adapted			
Physical internal attributions (onset)	N/S		0.27**

*p<0.05; **p = 0.06

Four global causal attribution/adjustment associations were found (Table 5.14). Only one significant chi-square was found, between the category, "Physical Internal Attributions" for the pain onset, and the use of physiotherapy treatment. Cramer's *V* values indicated that the remainder of the results involved attributions being weakly associated or approaching significance in being weakly associated with adjustment. Further exploratory analyses revealed two subgroup effects within the association between the category "Physical External Attributions" for the pain onset with negative emotions towards the pain at its onset, for those who were middle-aged (X^2,4.08; df = 1; $p<0.05$; Cramer's *V* = 0.52, $p<0.05$), and married (X^2,4.14, df = 1, $p<0.05$; Cramer's *V* = 0.42, $p<0.05$).

5.3.3.5 The Adaptive/Maladaptive Nature of the Adjustment Outcomes

The next two parts of the aim consider whether making responsibility and/or blame attributions within the category "Self" was adaptive for adjustment to pain, and whether making responsibility and blame attributions within the category, "Other" resulted in poor adjustment to pain. However, before answering these questions there is a need to consider which adjustment outcomes were adaptive and which were maladaptive. The adaptive nature of the outcomes was determined both from the participants responses, and from the literature reviewed in Chapter 2. These are summarised in the following table.

Table 5.15: The adaptiveness/maladaptiveness of the adjustment outcomes

Outcome	Adaptive	Maladaptive	Neither
Health			
Treatments			
Oral medications			x
Physiotherapy			x
Complementary treatment			x
Surgery			x
Self-management			
Physical	x		
Psychological	x		
Do what is required by health professionals			x
Psychological			
Positive statements (Onset, now & since)	x		
Negative emotions (Onset, now & since)		x	
Functioning			
Social:			
Support			
From family	x		
From friends	x		
Life			
Unaffected	x		
Adapted	x		
Limited		x	
Physical			
Leisure/social limitations		x	
Daily limitations		x	
Adapted ability to function	x		

Some adjustment outcomes were neither adaptive nor maladaptive (Table 5.15). Pain treatments were neither, because they may be either effective or ineffective. Additionally, doing what health professionals require does not represent a self-pain management strategy. While this may help alleviate pain, making it adaptive, it does not represent adaptive strategies initiated by the participants themselves to alleviate pain. For this reason it was neither adaptive nor maladaptive.

The rest of the adjustment outcomes in Table 5.15 were more obviously adaptive or maladaptive. Physical and psychological self-management of the pain were adaptive, because they represent methods initiated by the participants to alleviate their pain, and while they may be ineffective, they at least represent some attempt to control pain. In terms of psychological outcomes, positive statements were adaptive, because they represent positive ways the sufferers have adapted to their pain. Negative emotions, on the other hand, represent negative reactions to the pain, and so are maladaptive. The adjustment outcomes reported in Chapter 2 have been considered in this way, i.e. negative emotions have been taken to reflect poor adjustment. Support from family and friends were adaptive, given that they were reported in a positive way, in terms of receiving practical and emotional support. Additionally, any social and physical functioning limitations were maladaptive in the sense that they interfered with the individual's life. Any ways in which the pain either did not adversely affect the individual's life, or ways in which the individual had adapted his/her life around the pain, were adaptive, in that they represented a continuing with normal life, despite pain.

5.3.3.6 The Adaptiveness of Responsibility/Blame Attributions Within "Self"

In order to determine the adaptiveness of attributions within the "Self" category, initial analyses were conducted between these attributions, and the maladaptive outcomes identified in Table 5.15, to determine whether these attributions could be maladaptive as well. All chi-square analyses were non-significant, suggesting this was not the case. Chi-square analyses did indicate, however, that self-blame approached significance in being associated with three adaptive outcomes outlined in Table 5.15. Firstly, self-blame attributions for the pain onset approached significance in being associated with reports of receiving support from the family (X^2, 3.49, df = 1, p = 0.06; Cramer's V = 0.29, p<0.05). Secondly, a self-blame/support from family association was also found for the pain now (X^2, 3.73, df = 1, p = 0.05, Cramer's V = 0.31, p<0.02). This was significant for the middle-aged participants (X^2,4.73, df = 1, p<0.05; Cramer's V = 0.59, p = 0.007). Thirdly, self-blame attributions for the pain now approached significance in being associated with reports of more positive statements than negative emotions reported towards the pain overall since its onset (X^2, 3.63, df = 1, p = 0.06, Cramer's V = 0.30, p<0.05). This association was particularly significant for the middle-aged (X^2, 4.59, df = 1, p<0.05; Cramer's V = 0.56, p = 0.009), and employed participants (X^2,4.27, df = 1, p<0.05; Cramer's V = 0.58, p<0.05). These associations suggest that attributing blame within the category "Self", is adaptive for adjustment to pain, especially for particular subgroups of participants.

5.3.3.7 The Maladaptiveness of Responsibility/Blame Attributions Within "Other"

In order to determine the maladaptiveness of attributions within the "Others" category, initial analyses were conducted between these attributions, and the adaptive outcomes identified in Table 5.15, to determine whether these attributions could be adaptive as well. All chi-square analyses were non-significant, suggesting this was not the case. Chi-square analyses revealed one global association between attributing responsibility within the category "Other", and the maladaptive outcomes in Table 5.15. Specifically, attributing responsibility to others for the pain now was associated with reports of more negative emotions than positive statements being made overall towards the pain since its onset (X^2, 4.45, df = 1, p<0.05, Cramer's V = 0.31, p<0.05). Two subgroup effects emerged, within this, for the divorced (X^2, 4.4, df = 1, p<0.05; Cramer's V = 1.000, p = 0.005), and retired participants in the sample (X^2, 3.7, df = 1, p=0.05; Cramer's V = 0.53, p<0.05). Although this is a single finding, it does suggest that attributing responsibility within the category, "Other", leads to poor adjustment to pain.

5.3.3.8 The Changing Nature of the Attribution/Adjustment Relationship

The results so far indicate there are few attribution/adjustment associations. A closer investigation of their global associations at different times in the pain experience using combined categories of response across all three attribution types supported these findings. Those few associations found are summarised in the following table.

Table 5.16: Summary of the attribution/adjustment relationships found for different times in the pain experience

Variables	X^2	df	Cramer's *V*
Health outcomes			
Treatment*			
Physiotherapy			
Attributions to the self (onset)	5.59**	1	0.34**
Physical internal attributions (onset)	4.49**	1	0.31**
Complementary			
Attributions to the self (onset)	4.83**	1	0.32**
Attributions to the self (now)	5.08**	1	0.34**
Attributions to others (onset)	N/S		0.24***
Physical external attributions (onset)	N/S		0.24***
Psychological outcomes			
Positive statements (Onset)			
Physical internal attributions (onset)	N/S		0.25***
Negative emotions (Onset)			
Physical external attributions (onset)	5.28**	1	0.33**
Functioning outcomes			
Support from friends			
Physical external attributions (now)	3.84***	1	0.31**
Support from family			
Physical internal attributions (now)	N/S		0.25***

*Treatment may be currently received/and/or received in the past
**$p<0.05$, ***$p = 0.06$

Many of the attribution/adjustment associations found were weak (Table 5.16). Additionally, since few associations were found, nothing can be concluded about the timing of the attribution/adjustment relationship. Little can be inferred from the nature of the relationships that were found, because they largely involved physiotherapy and complementary treatment, both of which can be undertaken at any time in the pain experience, interacting with attribution categories (Table 5.16). However, the other associations suggest that attributions and adjustment are associated when both are made for the same time period i.e. the pain onset or now, regardless of the direction of the relationship. These include that Cramer's *V* associations indicated that responses within the category “Physical Internal Attributions” for the pain onset were associated with positive statements made towards the pain for its onset. Additionally, responses within the category “Physical External Attributions” for the pain onset were associated with negative emotions towards the pain at its onset. This indicates that physical internal attributions are adaptive, while physical external attributions result in poor adjustment to pain.

Several subgroup effects emerged within the global associations between attribution categories and the reported pain treatments. Firstly, the association between physiotherapy treatment and the category attributions to the “Self” for the pain onset was particularly significant for married (X^2,5.05, df = 1, p<0.05; Cramer’s V = 0.46, p = 0.009), and employed participants in the sample (X^2,10.70, df = 1, p<0.005; Cramer’s V = 0.81, p = 0.000). Secondly, the association between physiotherapy and “Physical Internal Attributions” for the pain onset, was significant for the married participants (X^2,5.37, df = 1, p<0.05; Cramer’s V = 0.47, p = 0.007). Thirdly, the association between complementary treatment, and the attribution category, “Self”, for the pain onset was significant for married participants (X^2, 5.37, df = 1, p<0.05; Cramer’s V = 0.47, p = 0.007). Fourthly, the association between complementary treatment and the category attributions to “Self” for the pain now was significant for the middle-aged (X^2,6.90, df = 1, p = 0.009; Cramer’s V = 0.67, p<0.005), married (X^2,9.79, df = 1, p<0.005; Cramer’s V = 0.63, p = 0.000) and employed participants (X^2,4.27, df = 1, p<0.05; Cramer’s V = 0.58, p<0.01).

The most common subgroup effects involved the married, middle-aged and employed participants of the sample. This might have been the case because these were frequent sample characteristics (see Chapter 4, section 4.6.3). Interesting attribution/adjustment subgroup effects emerged within the categories "Self" and "Others". These will be discussed in Chapter 6.

5.3.3.9 Summary

This aim investigated the nature of the relationship between cause, responsibility and blame attributions for pain, and adjustment to pain. There were five parts to the aim. The first part was concerned with differences in the ability to predict adjustment between those who made causal attributions for their pain, and those who did not. No differences were found. The rest of the analyses were concerned with the adaptive and maladaptive nature of attributions, and the timing of the attribution/adjustment relationship. Few attribution/adjustment associations found at all, making it impossible to draw any conclusions about the timing of the relationship. However, the few associations found between adjustment and the categories "Self" and "Other" indicated making attributions to the self is adaptive, while attributing responsibility to others results in poor adjustment to pain.

One surprising finding to emerge from the data is that there was some indication physical internal attributions may be adaptive, while physical external attributions may result in poor adjustment to pain. This is because physical internal attributions tended to be more associated with adaptive outcomes (social life adapted to pain, social support and positive statements towards the pain at its onset), albeit weakly. Physical external attributions, on the other hand, were more associated with negative outcomes (negative emotions towards the pain at its onset). One explanation for these results may be that the physical internal attributions were adaptive because they were made to factors that could be considered to be outwith the control of the pain sufferers e.g. hereditary factors (section 5.2). This could be adaptive because the pain sufferers could then feel they had no role in the development of their condition. However, physical external attributions by their nature were more controllable e.g. leisure activities (section 5.2), and so the participants did have some role to play in the development of their condition. This could result in poor adjustment to pain.

Further exploratory analyses revealed several subgroup effects within the global attribution/adjustment associations found, most of which involved the middle-aged, married and employed participants.

5.3.4 The Belief in a Just World

5.3.4.1 Introduction

The fourth aim of the study was to explore the role of the belief in a just world in the experience of pain. There were three parts to this (Chapter 3, section 3.3.4), each of which will be considered in turn, before the section is summarised.

5.3.4.2 The Just World Beliefs of Pain Sufferers

The mean just world score for the pain sample was 67.56, out of a possible maximum score of 120. The standard deviation was 9.22, with scores ranging between 45 - 90. This score is comparable to that obtained in related, spinal-injured samples, and experimental student groups. These scores are summarised in Table 5.17.

Table 5.17: Mean just world scores obtained on the Rubin and Peplau (1975) Just World Scale

Study	Mean Just World Score (Maximum = 120)
Spinal-injured samples	
Bulman and Wortman (1977)	0.5*
Heinemann et al (1988)	58.4
Kiecolt-Glaser and Williams (1987)	76.7
Experimental student samples	
Lipkus et al (1996)	70.2
Rubin and Peplau (1975)	03.1*
Tanaka (1999)	66.7
Tomaka and Blascovich (1994)	78.4

*Scores based on mean values not actual scores

Table 5.17 indicates all scores fell within a similar range, from 58.4-78.4. The distribution of the just world scores of the pain sample can be seen in Figure 5.1.

Figure 5.1: Distribution of just world scores

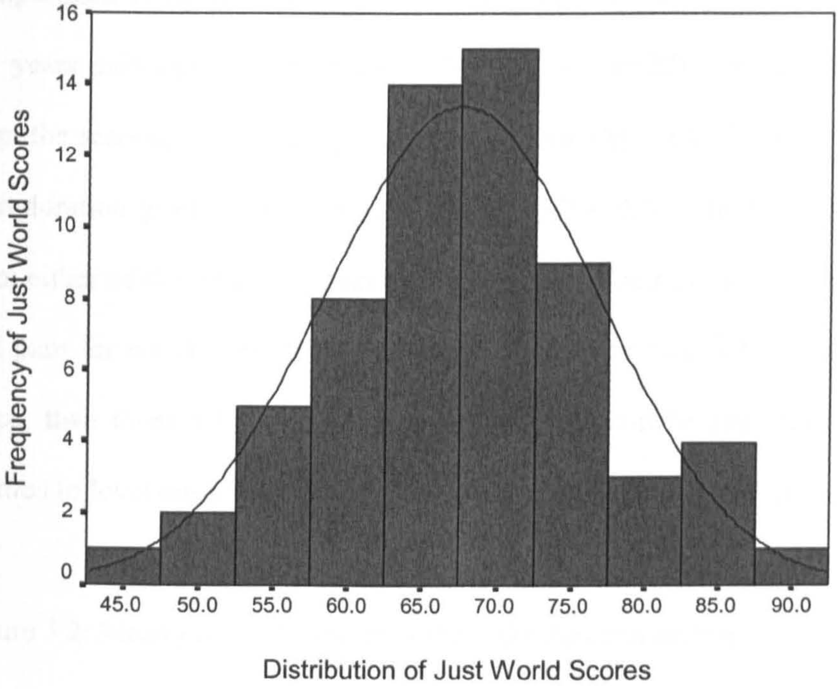
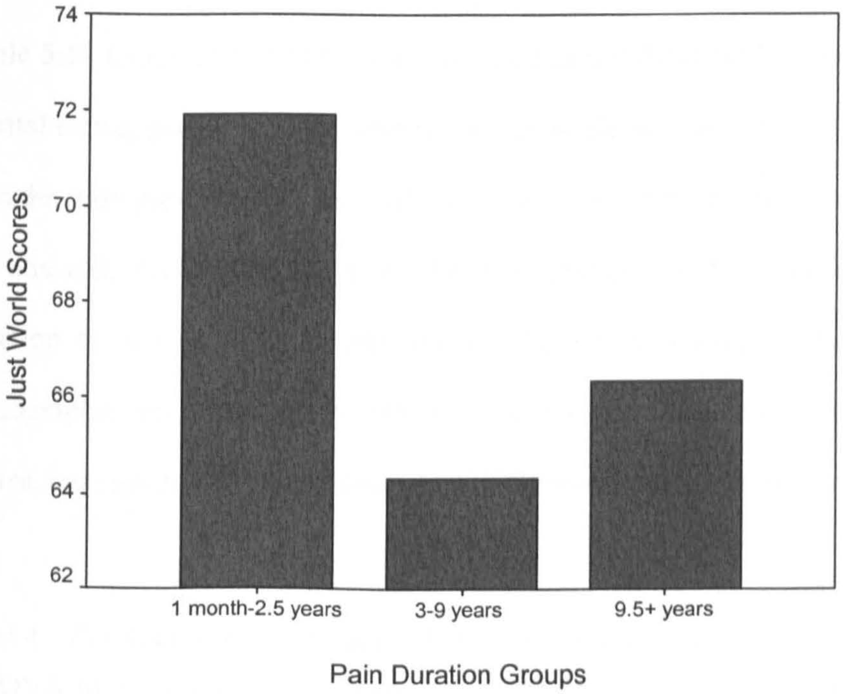


Figure 5.1 shows that the just world scores of the pain sample were approximately normally distributed.

5.3.4.3 Differences in Just World Beliefs Within Pain–Related Variables

ANOVA was used to determine any differences in just world scores between the different type of pain and pain duration groups. No differences were found between the type of pain groups (F(4,57) = 1.5, p = 0.21), but ANOVA comparing the just world scores of different pain duration groups produced a significant result (F(2, 59) = 4.26, p = 0.01). This indicated a difference in the strength of just world beliefs between the pain duration groups. There was a large difference in the mean scores between groups. The effect size, calculated using eta squared, was 0.13. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for the 1 month - 2.5 years pain duration group (M = 71.95, SD = 10.27) was significantly different from the second, 3 - 9 years pain duration group (M = 64.33, SD = 7.70). The third pain duration group, 9.5+ years (M = 66.35, SD = 9.22), did not significantly differ from either of the other two pain duration groups. The results indicate that those who had pain for the shortest length of time had stronger beliefs that the world is a just place, than those who had suffered pain for the middle pain duration. The effect seemed to level out after 9 years' pain duration. This can be seen in Figure 5.2.

Figure 5.2: Mean just world scores across pain duration groups



Further ANOVA were conducted to determine any demographic factors that might interact with pain duration in its effect on just world belief scores. The results of this analysis can be seen in Table 5.18.

Table 5.18: Demographic influences on just world scores

Group	df	F	p
Independent effects			
Pain duration	2	2.90	0.09
Employment status	3	2.93	0.07
Marital status	4	2.34	0.11
Gender	1	2.73	0.12
Age	2	1.15	0.35
Interaction effects			
Pain duration/employment	3	0.56	0.65
Pain duration/marital status	1	0.15	0.31
Pain duration/gender	1	0.55	0.47
Pain duration/age	1	0.47	0.51

Table 5.18 indicates that there were no significant differences between employment, marital status, gender and age groups, on just world scores, and differences between pain duration groups were cancelled out when these other variables were entered into the analysis. Additionally, none of the demographic variables interacted with pain duration to influence just world scores. These results suggest that not only did demographic variables fail to influence the effect of pain duration on just world scores, but also there were no demographic differences on just world scores.

5.3.4.4 The Role of Attributions in Maintaining Just World Beliefs

ANOVA to determine any differences in just world scores between those who made causal attributions for the pain now and those who did not (reporting their pain to be "just there") revealed non-significant main effects for making attributions (F(1,57) = 2.46, p = 0.12), not making them (F(1,57) = 0.92, p = 0.43), and interactions between them (F(1,57) = 0.65, p = 0.43). This suggests both groups did not differ in their just world scores. Additional ANOVA to determine whether those who attributed responsibility or blame to themselves differed in their just world beliefs from those who made these attributions to others revealed non-significant main effects for attributing responsibility to the self (F(1,57) = 0.003, p = 0.96), others (F(1,57) = 0.72, p = 0.79), or interactions between them (F(1,57) = 0.01, p = 0.93). There were also no main effects for attributing blame to the self (F(1,55) = 0.25, p = 0.62), others (F(1,55) = 0.002, p = 0.97), or interaction effects between them (F(1,55) = 0.31, p = 0.58). These results suggest there were no differences in just world scores between those who made attributions to themselves versus others.

Further exploratory analyses using multiple regression techniques to determine the ability of attributions in general to predict just world beliefs were non-significant (not tabulated), suggesting that beyond no differences in just world beliefs being found between attribution groups, attributions did not interact with just world beliefs at all.

5.3.4.5 Summary

This aim explored the role of just world beliefs in the experience of pain. The mean just world score obtained, 67.56 is just above the midpoint of the scale. Scores around the midpoint have been interpreted as reflecting a belief in a random world (Furnham, 1998). Being just above the midpoint of the scale, the score indicates that the pain sufferers hold some belief that the world is a just place.

ANOVA produced no differences in the just world beliefs of those with different types of pain. However, differences were found for pain duration. Those with the shortest pain duration were found to have significantly stronger just world beliefs than those who had pain for between 3 - 9 years' duration. This effect seemed to level out after nine years' pain duration. ANOVA also indicated that attributions have no role to play in maintaining just world beliefs. There were no differences in just world beliefs of those who made causal attributions for their pain now, and those who did not. Additionally, there were no differences in just world beliefs between those who attributed responsibility and blame to themselves versus others for their pain. No individual differences were found in just world scores.

5.3.5 Differences in Adjustment Between Those With Differing Strengths of Just World Beliefs

Having explored just world beliefs in pain, the final aim was to determine any differences in adjustment to pain between those with differing strengths of just world beliefs (Chapter 3, section 3.3.5). Justification for this analysis comes from a review of the just world literature in Chapter 2 (section 2.2.4.6) which suggested that stronger just world believers adapt better to a range of situation than weaker just world believers. In order to examine this, percentile ranges were used to convert the just world scores into low (0-65), medium (65-71) and high (72+) scores. Chi-square analyses revealed non-significant differences between these groups on each of the health, psychological and functioning outcomes (not tabulated), suggesting they did not differ in their adjustment to pain.

Further exploratory analyses using multiple regression techniques to determine the ability of the health, psychological and functioning outcomes to predict just world beliefs were non-significant (not tabulated), suggesting that in the present study adjustment did not interact with just world beliefs at all.

5.3.6 Exploring Interactions Between Pain Intensity and Main Study Variables

5.3.6.1 Introduction

Previous sections have addressed the aims of the study outlined in Chapter 3. These analyses established that attributions interacted with adjustment and pain and demographic variables, but not just world scores, while adjustment interacted with pain and demographic-related variables, but not just world scores. Indeed, just world scores only interacted with one pain-related variable, pain duration. One important variable associated with the study sample, pain intensity, has yet to be considered. Given that the present study is an exploratory investigation, the next section will examine interactions between pain intensity and the main study variables.

Interactions between pain intensity and the main study variables will be considered in the following sections. Firstly, the pain intensity of the sample. Secondly, individual differences in pain intensity. Thirdly, the ability of attributions to predict pain intensity. Fourthly, associations between pain intensity and just world beliefs. Fifthly, differences between pain intensity groups on adjustment outcomes.

5.3.6.2 Pain Intensity

Some outlying values on the sensory, affective and overall scores on the subscales of the SF-MPQ created positive skewness. This was resolved through the mean score of the sample on each subscale being assigned to correct for the skewness, resulting in normally distributed scores being obtained. This happened for the sensory present pain intensity score (reducing skewness from 1.55 to 0.22), and the sensory usual pain intensity score (reducing skewness from 0.37 to –0.20). Other pain scores required to be transformed to correct for skewness. However, given the difficulty in interpreting data from transformed scores (Tabachnik and Fidell, 1996), only untransformed scores were used in subsequent analyses. Table 5.19 summarises the mean combined sensory and affective scores on the SF-MPQ for each of the three time periods, along with the means of their corresponding pain scale scores.

Table 5.19: Mean pain scores for present pain, usual pain and pain at its worst *(N = 60)

Pain Time	Mean	Std Dev	Min	Max
Present (Combined)**	8.13	6.16	0.0	22.0
Present (Scale)***	04.2	2.50	0.0	10.0
Usual (Combined)	18.42	9.46	4.0	44.0
Usual (Scale)	6.01	2.08	0.9	10.0
Pain at Worst (Combined)	25.42	10.35	3.0	42.0
Pain at Worst (Scale)	8.75	01.5	3.5	10.0

*Data was missing from two participants
**Maximum combined score = 45
***Maximum scale score = 10

The overall mean pain intensity scores were lower at the time of the interview (8.13), than on a usual day (18.42), and when the pain was at its worst (25.42) (Table 5.19). ANOVA revealed significant differences between the pain scores, Wilks's Lambda = 0.21, (F(2, 58) = 108.12, p<0.001), multivariate eta squared = 0.79. A post-hoc analysis using the Bonferroni procedure revealed each of the overall present, usual and worst pain intensity scores to be significantly different from each other.

Table 5.19 also indicates inconsistencies in the pain scores obtained. The pain scale scores for each of the three time periods did not parallel their corresponding combined sensory and affective scores. Instead, they were higher, reaching values around the midpoint of the scale for present pain (4.20), and higher than the midpoint of the scale for usual pain (6.01), and pain at its worst (8.75). However, despite these inconsistencies, each pain scale score was correlated with its corresponding overall score, such that for present pain intensity r = -0.23, n = 60, p = 0.01, for usual pain intensity r = 0.61, n = 60, p = 0.01, and for pain at its worst r = 0.57, n = 60, p = 0.01.

For the purpose of subsequent analyses, only usual pain intensity will be considered because this best represented the participants' pain experiences. The overall pain descriptor score was used rather than the pain scale score, because this presented a more detailed evaluation of the sensory and affective components of pain intensity.

5.3.6.3 Individual Differences in Usual Pain Intensity

An exploration of individual differences in usual pain intensity produced both demographic and pain-related differences. These differences and their significant interaction effects are summarised in Table 5.20.

Table 5.20: Individual differences in usual pain intensity

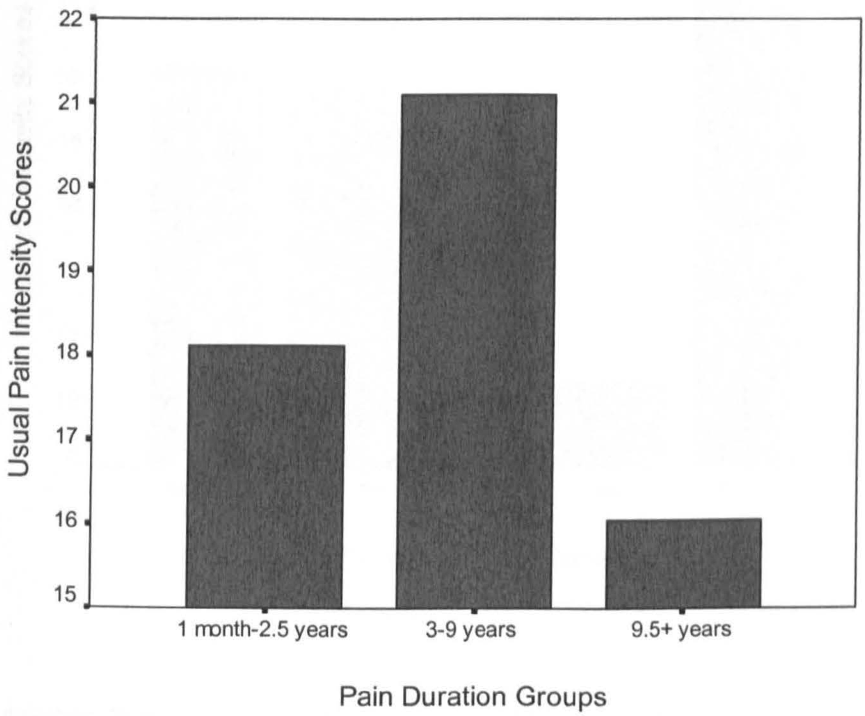
Group	df	F
Independent effects		
Pain Duration	2	14.12***
Employment	3	0.35
Marital status	4	8.25***
Gender	1	5.04*
Age	2	6.49*
Interaction effects		
Pain duration and gender	1	10.38**
Marital status and gender	2	8.28**

***p<0.005; **p<0.01; *p<0.05

Four independent effects emerged (Table 5.20). A post-hoc test could not be conducted for gender because there were only two groups, but an analysis of mean scores indicated that males (M = 19.12; SD = 1.25), and females (M = 19.02; SD = 0.85) were similar in their usual pain intensity. In terms of age, a post-hoc comparison using the Tukey HSD test indicated that none of young (M = 19.12; SD = 1.20), middle-aged (M = 20.66; SD = 1.18), and older age groups (M = 17.26; SD = 1.27) differed significantly from each other on their usual pain intensity scores. They all have an effect on usual pain intensity.

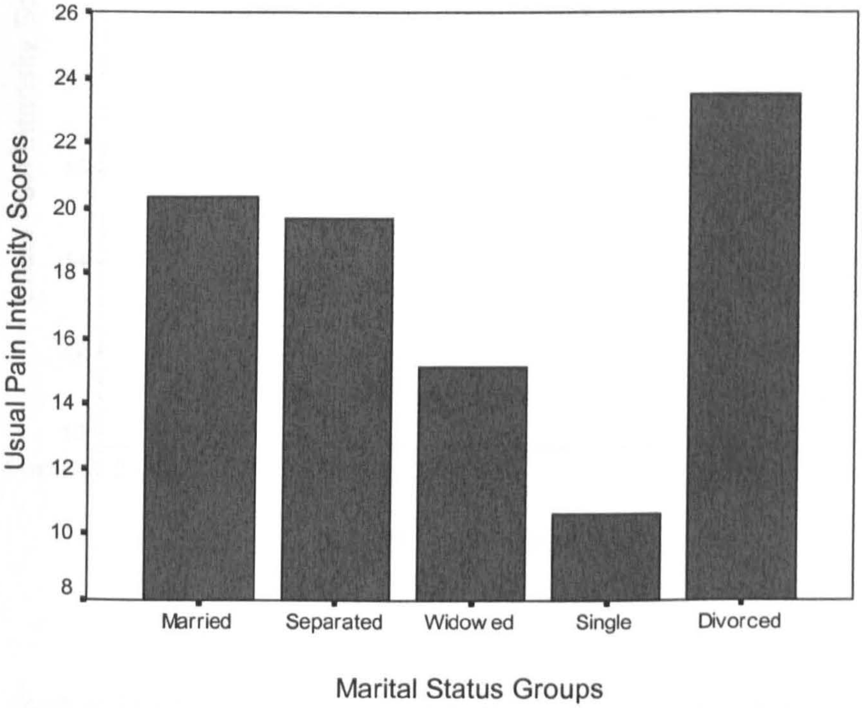
In terms of pain duration groups, a post hoc test indicated that those with pain for between three to nine years' duration had significantly different pain scores from those who had pain for over nine years' duration. An examination of mean scores indicated that those with pain for between three to nine years' duration had higher pain scores (M = 21.67, SD = 1.20) than those with pain for over nine years' duration (M = 15.53, SD = 1.21). This difference can be seen in Figure 5.3.

Figure 5.3: Differences in usual pain intensity between pain duration groups



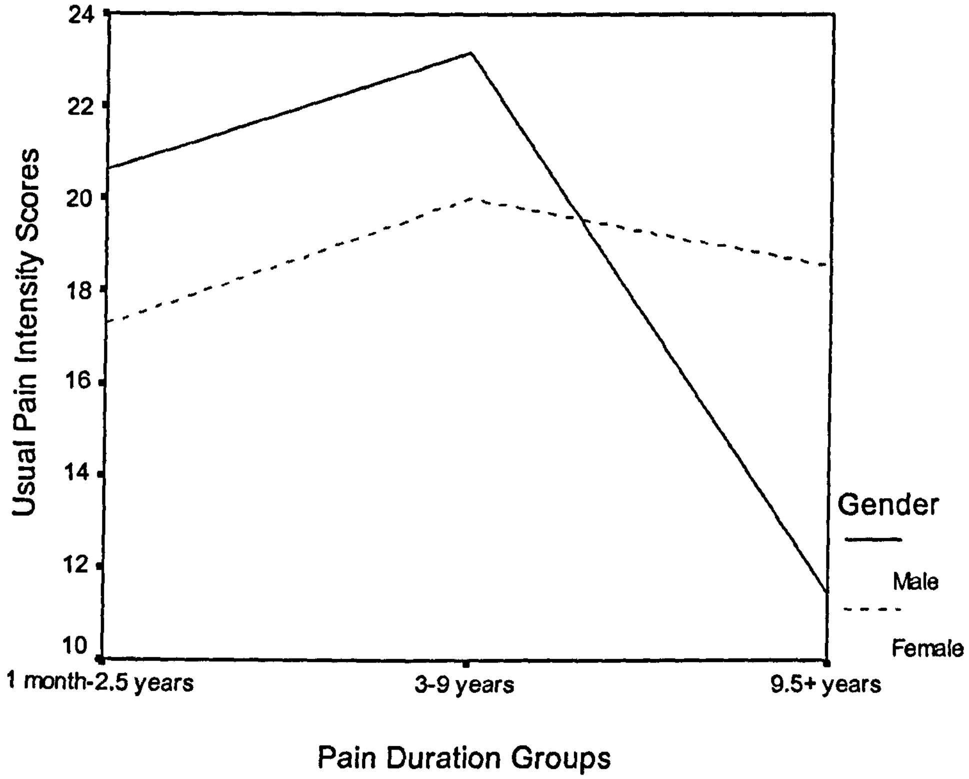
In terms of marital status groups, a post-hoc test indicated that those who were single had significantly different usual pain intensity scores from those who were married, and divorced. An examination of mean scores indicated that those who were single had significantly lower pain scores (M = 11.81, SD = 1.73), than those who were married (M = 20.58, SD = 0.95), and divorced (M = 23.50, SD = 1.82). This difference can be seen in Figure 5.4.

Figure 5.4: Differences in usual pain intensity between marital status groups



An examination of interaction effects indicated that gender interacted both with pain duration and marital status in their effects on usual pain intensity scores (Table 5.20). The interaction between pain duration and gender can be seen in Figure 5.5.

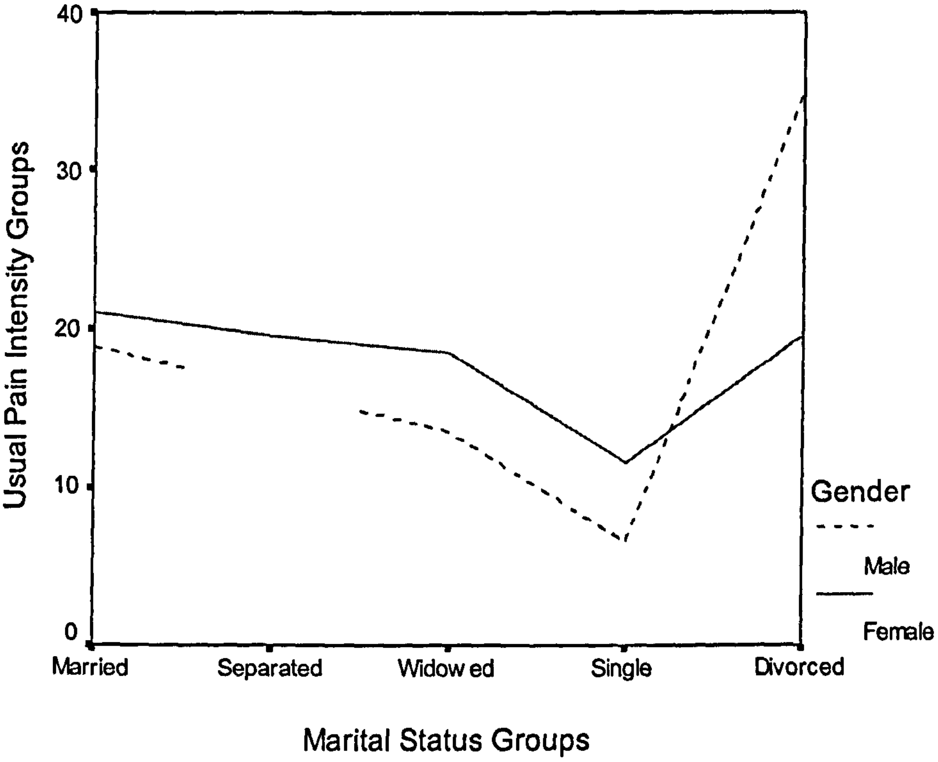
Figure 5.5: Interaction between pain duration and gender on usual pain intensity



The graph indicates that males with pain for between three to nine years' duration had higher pain scores than the males in the other pain duration groups, and the females of the sample. Additionally, females within this pain duration had higher usual pain intensity scores than the females in the other groups. Further exploration of these gender differences using ANOVA suggested that the observed differences in pain intensity between male pain duration groups was non-significant ($F(2,16) = 2.31$, $p = 0.13$), as were those for the female pain duration groups ($F(2,38) = 0.34$, $p = 0.71$).

The interaction between marital status and gender can be seen in Figure 5.6.

Figure 5.6: Interaction between marital status and gender on usual pain intensity



The graph indicates that divorced males had higher usual pain intensity scores than married, separated or single males, and the females of the sample. Additionally, widowed females had higher usual pain intensity scores than females in the other marital status groups. Further exploration of these gender differences using ANOVA indicated that the observed difference in usual pain intensity between females marital status groups was non-significant (F(2,36) = 2.21, p = 0.09), but the observed differences between male marital status groups was statistically significant (F(3,15) = 3.34, p = 0.05). Post hoc analyses using the Tukey HSD test indicated that divorced males had significantly higher pain intensity scores (M = 35.00, SD = 12.73), than single males (M = 6.50, SD = 0.71).

5.3.6.4 Pain Intensity and Attributions

A stepwise multiple regression was conducted to determine whether any of the independent variable, attribution factors, "Attributions to the Self", "Attributions to others for the pain onset", and "Attributions to others for the pain now" predicted the dependent variable, usual pain intensity. Only the factor "Attributions to others for the pain onset" was significant ($F(1,52) = 8.12$, $p = 0.006$). However, R^2 was only 13.5%, indicating this factor only explained a small amount of the variance of usual pain intensity. As such, it is possible that other factors might be related to the dependent variable. Further regression analyses indicated that none of the age, gender, pain duration, marital or employment status variables, or just world beliefs interacted with attributions in their effect on pain intensity.

5.3.6.5 Pain Intensity and Just World Scores

A Pearson's correlation coefficient was calculated to determine whether pain intensity and just world scores were correlated with each other. This was significant ($r = -0.227$, $n = 60$, $p = 0.04$, one-tailed), providing some indication that pain intensity and just world scores are associated with each other. However, further exploratory multiple regression analyses using all present, usual and worst pain intensities suggested that pain intensity does not predict just world scores.

5.3.6.6 Pain Intensity and Adjustment

Stepwise multiple regression analyses to examine whether any types of adjustment predicted usual pain intensity, indicated that types of treatment predicted pain intensity. These are listed in Table 5.21.

5.21: Treatment predictors of usual pain intensity

Variable	R^2	ΔR^2	β final	t final	p final
Physiotherapy	0.141	0.127	-0.389	-3.376	0.001
Oral medications	0.225	0.198	0.345	2.956	0.005
Do what is required by health profession	0.281	0.242	0.246	2.087	0.041

Stepwise procedures entered physiotherapy first, and this alone predicted 14.1% of the variance in usual pain intensity. When oral medications was entered, together this predicted 22.5% of the variance, and when "Do what is required by health professionals" was entered, all three variables together predicted 28.1% of the variance in usual pain intensity (Table 5.21).

Further analyses were conducted to determine any differences in treatment between participants with different intensities of pain. To achieve this, the sample was split into those with lower (0 - 14); medium (15 - 22) and higher (23+) usual pain intensities, based on percentile ranges. Chi-square analyses indicated that the groups differed in their pain management techniques. The nature of these differences are summarised in the following table. For each difference, the table produces significance levels, indicates where within each group the differences lie, and provides information on the extent to which the three pain duration groups did and did not use each pain management technique.

Table 5.22: Differences in health adjustment outcomes between usual pain intensity groups

Adjustment outcome	Reported (%)	Not reported (%)
Pain treatments		
Physiotherapy		
Lower (0-14)	57.1*	20.6*
Medium (15-22)	25.0	32.4
Higher (23+)	17.9	47.1
Total	100	100
Statistical significance X^2, 9.68, df = 2, $p<0.01$		
***Statistical difference X^2, 5.50, df = 1, $p<0.05$**		
Complementary		
Lower (0-14)	10.5*	48.8*
Medium (15-22)	47.4	20.9
Higher (23+)	42.1	30.2
Total	100	100
Statistical significance X^2, 8.94, df = 2, $p<0.05$		
***Statistical difference X^2, 5.13, df = 1, $p<0.05$**		
Self-management of pain		
Psychological		
Lower (0-14)	26.7	40.4
Medium (15-22)	60.0*	19.1*
Higher (23+)	13.3	40.4
Total	100	100
Statistical significance X^2, 9.58, df = 2, $p<0.01$		
***Statistical difference X^2, 6.37, df = 1, $p<0.05$**		
Do what is required by health professionals		
Lower (0-14)	36.4	37.3
Medium (15-22)	0.0	35.3
Higher (23+)	63.6*	27.5*
Total	100	100
Statistical significance X^2, 7.38, df = 2, $p<0.01$		
***Statistical difference X^2, 3.57, df = 2, $p = 0.06$**		

Differences were found between usual pain intensity groups in both pain treatment and self-management techniques (Table 5.22). Specifically, those with the lower usual pain intensity most frequently reported receiving/having received physiotherapy as treatment for their pain (57.1%) than the other pain duration groups. Those with the medium usual pain intensity most frequently reported using both complementary treatments (47.4%), and psychological self-management techniques (60.0%). Those with the higher pain intensity more frequently reported doing what was required by their health professionals to manage their pain (63.6%).

5.3.6.7 Summary

The results of this section indicated that each of the overall present, usual and worst pain intensities were statistically different from each other. An exploration of interactions between usual pain intensity and other study variables indicated four things. Firstly, there were individual differences in usual pain intensity scores between gender, age, marital status and pain duration, the latter two of which were mediated by gender. Secondly, making attributions within the category "Others" for the pain onset predicted usual pain intensity. Thirdly, usual pain intensity and just world scores were weakly associated with each other, and fourthly, there were differences between those with low, medium and high usual pain intensity scores on their pain management techniques.

5.4 SUMMARY OF CHAPTER

This chapter presented the results of the study, in two main sections. The first section presented the results of a qualitative analysis of the thematic content of pain attributions. Four thematic categories emerged from these attributions: "Physical Internal Attributions", "Physical External Attributions", "Attributions to the Self", and "Attributions to Others". The second section presented the results of the analysis of the five study aims outlined in Chapter 3 (section 3.3).

Three aims of the study were concerned with attributions, adjustment, and their interactions in pain. In terms of attributions, most participants made causal attributions for their pain, while around half the sample attributed responsibility, and just under half attributed blame for their pain. Statistical associations between the concepts created ambiguity about whether or not the concepts were distinguished from each other, although descriptively, differences in magnitude suggested that causal attributions were distinguished from responsibility and blame, which were indistinguishable from each other. Descriptive and statistical analyses indicated that the attributions made largely did not change between the pain onset and now (at interview). Finally, causal attributions were not associated with possible motives for making them.

A second aim involved reported types of adjustment to pain, in relation to health, psychological and functioning outcomes, each of which were found to be independent of each other. Participants reported a range of positive and negative ways in which they had adjusted to their pain. Positive adjustment included feeling positively about pain in general, and being able to function in daily and social activities, despite pain, as well as adapt one's life around pain. Negative adjustment was more common and was characterised by a range of negative feeling about pain, as well as daily and social limitations placed on one's life, by pain. On a descriptive level, the nature and number of the reported positive and negative feelings changed for different times in the pain experience, although these were largely statistically non-significant.

Few interactions between attributions and adjustment emerged. However, the results from this analysis indicated three main things. Firstly, making causal attributions and not making them do not differ in their ability to predict adjustment. Secondly, making attributions to the self for one's pain is adaptive for adjustment to pain, and thirdly, making attributions to others for one's pain leads to poor adjustment to pain.

The last two aims of the study were concerned with the role of just world beliefs in pain, in terms of interactions between these beliefs and pain-related variables, and differences in adjustment between high, medium and low just world belief groups. The results indicated that there were differences in just world scores between pain duration groups, where those who had experienced pain for between 1 month-2.5 years' duration had significantly stronger just world beliefs, than those who had experienced pain for between 3-9 years' duration. However, no type of pain differences emerged. The results also indicated that attributions have no role to play in maintaining just world beliefs. Finally, no differences in adjustment emerged between the just world belief groups.

The quantitative section of the results also presented the results of an exploratory analysis of interactions between the main study variables with an important pain variable, pain intensity. The results indicated that firstly, there are individual differences in pain intensity, some of which interact with each other. Secondly, making attributions to other people for the pain onset is a predictor of pain intensity. Thirdly, pain intensity and just world beliefs are associated with each other, and fourthly, different pain intensity groups vary in their pain management strategies.

Overall this exploratory study revealed several interactions between the main study variables. Firstly, attributions interacted with adjustment, pain intensity, and other pain and demographic-related variables, but not just world beliefs. Secondly, in addition to attributions, adjustment interacted with pain and demographic-related variables, and pain intensity, but not just world beliefs. Thirdly, in addition to attributions and adjustment, just world beliefs did not interact with demographic variables, but did interact with pain duration and intensity. Fourthly, in addition to attributions, adjustment and just world beliefs, pain intensity interacted with other pain and demographic variables.

CHAPTER 6: DISCUSSION OF RESULTS AND CONCLUSIONS

6.1 INTRODUCTION

This chapter will discuss the main results of the study from Chapter 5. The discussion will be undertaken in the following five sections. Firstly, a summary of the study rationale will be provided in terms of the general purpose of the study, theoretical background, the study sample employed, the phases of the study, and the specific research aims of the study. Secondly, a description of the study results in relation to the five aims outlined will be provided. Contributions to the literature will be considered in relation to the results. Thirdly, the results of an exploration of relationships between pain intensity and the main study variables will be described. Fourthly, limitations of the study will be discussed, and finally future studies following from the study will be detailed.

6.2 SUMMARY OF THE STUDY RATIONALE

6.2.1 General Purpose of the Study

The present study was undertaken to address methodological issues and shortcomings of research examining attributions, just world beliefs and adjustment in pain. Taking these issues into account made the study an exploratory investigation, because the concepts have not been measured in this way before in pain.

6.2.2 Theoretical Background to the Study

Three independent theoretical backgrounds informed the research in the present study. The first is Gate Control Theory (Melzack and Wall, 1965). This was the first pain theory to consider not only the physiological experience of pain, but also psychological mechanisms that can affect individual perceptions and interpretations of the pain experience. The theory holds that there is a "gating" mechanism in the dorsal horns of the spinal cord that can be opened or closed to modulate incoming pain signals before they reach the brain. The route from the periphery to the brain passes through a series of physiological stages. Once pain information has reached the brain, several psychological factors such as emotion, past experience, and attention can influence how the pain is perceived. Psychological factors can also open and close the gate in descending inhibitory controls from the brain, suggesting the existence of a feedback loop, from the spinal cord to the brain, and back to the spinal cord (Chapter 2, section 2.1.5.4). Several criticisms have been made of this theory. Despite this, being the first theory to discuss the physiological and psychological components of pain together, it remains the most influential working model for pain researchers. Gate Control Theory formed part of the theoretical background to the present study because it highlighted the role of psychological processes in the pain experience.

The second theoretical framework was Shaver's (1985) Theory of Blame Assignment. The central tenet of the theory is that cause, responsibility and blame are related but conceptually distinct from each other. Specific criteria must be fulfilled before blame can be assigned. To summarise the criteria, an individual must have intentionally caused a negative outcome, leading to the assignment of responsibility to the person. Once found responsible, certain conditions must be met before blame is assigned. These are that the intention to create harm, with a full knowledge of the consequences of the behaviour must be present. Additionally, the actions taken to produce the negative consequences must be voluntary, and the individual must have had a normal capacity to understand what he/she was doing. There must also be an absence of a good excuse or justification for the behaviour (Chapter 2, section 2.2.3.3).

This theory has been criticised on the basis that people may not assign blame in this way. Instead, they might blame others through recklessness rather than intentional action, and may even assign blame when they know it is not warranted, because to do this serves some psychological purpose for them (Shaver, 1992). It has also been suggested that such conceptually sophisticated distinctions should not be imposed on the lay perceiver. Instead, they should be allowed to make their own conceptual errors when distinguishing between the concepts (Lalljee, 1981). Most of the research reviewed in Chapter 2 adopted this strategy when measuring attributions. Few studies have been found to define the concepts. Thus, Shaver's (1985) conceptual distinctions have had little opportunity to be empirically tested. Although Shaver's (1985) conceptual distinctions were not used in the present study to define the concepts, for the reasons given in Chapter 4 (section 4.3.3.7), the theory did provide a framework for distinguishing between cause, responsibility and blame. As such, it was relevant to use as a reference against which to compare any empirical distinctions found between the concepts in the present study.

The third theoretical framework of the study involved Just World Theory (Lerner, 1980). This is based on the just world hypothesis, which states that people have a need to live in a world where people get what they deserve and deserve what they get. The belief allows people to view their environment as stable and orderly, creating a predictable and manageable world (Chapter 2, section 2.2.4.2). The extent to which people believe the world to be a just place can be threatened by situations of personal suffering, and there are various ways that just world beliefs can be maintained in these situations (Chapter 2, section 2.2.4.4). However, the use of Just World Theory in situations of personal suffering is limited, since just world beliefs and reactions to one's own suffering is a relatively new area of research (Hafer and Olson, 1998). The available literature on this has measured just world beliefs in situations of experimental suffering, and in real-life cases of short-term loss e.g. loss of employment. Just World Theory has not been found to be applied to real-life pain situations, hence the exploratory nature of the present study.

6.2.3 The Study Sample

The study was conducted on a sample of working age adults suffering from mixed pain complaints of various pain durations in the community. The selection of this sample was based on the shortcomings of the pain/illness/injury patients recruited into the studies reviewed in Chapter 2. The specific nature of the samples recruited into these studies limits the extent to which the results produced are generalisable across samples. In order to avoid such restrictions and explore the possible wider applicability of the study findings, people suffering from mixed pain complaints were recruited. Another advantage of using a mixed pain sample is that people of varying ages are more likely to be recruited than in a specific condition that may be age-related, as in the studies reviewed in Chapter 2. Additionally, a community pain sample was used in the present study to control for the selection bias of these samples.

6.2.4 The Phases of the Study

In order to take account of the methodological issues and shortcomings of the attribution, just world and adjustment literature, the research undertaken in the present study was in two phases. The first phase involved a brief study to pilot a semi-structured interview schedule devised to take these issues into account. The second phase was the main phase of the study, using a revised version of the piloted schedule to investigate these issues in a series of aims. Justification for the questions in the interview schedule will be considered in the description of the main study findings, in section 6.3. The next section will outline the research aims of the study. Given that the aims were based on the shortcomings of the literature addressed using the interview schedule, justification for their investigation in the present study will be made in section 6.3.

6.2.5 The Research Aims

There were five aims of the present study, as follows.

1. To examine the cause, responsibility and blame attributions made for pain. Specifically, to determine whether or not these attributions were made, their nature, whether or not distinctions were made between them, whether or not they changed for different times in the pain experience, and to explore particular motives for making them, in the form of knowledge and uncertainty factors.
2. To explore various ways of adjusting to pain, using health, psychological and functioning outcomes.
3. To investigate the nature of the relationship between cause, responsibility and blame attributions, and adjustment to pain. There were five parts to this. Firstly, to determine whether there were any differences in adjustment to pain between those who made causal attributions for their pain, and those who did not. Secondly, to determine the nature of the relationship between causal attributions made for, and adjustment to pain. Thirdly, to determine whether or not attributing responsibility and blame to the self was adaptive for adjustment to pain. Fourthly, to determine whether or not attributing responsibility and blame to other people resulted in poor adjustment to pain. Fifthly, to determine whether or not the attribution/adjustment relationship varied for different times in the pain experience.

4. To explore the role of just world beliefs in the experience of pain, specifically determining the strength of the just world beliefs held by pain sufferers, and exploring differences in just world beliefs between different types of pain and pain duration groups. Additionally, the role of cause, responsibility and blame attributions in maintaining just world beliefs was considered.
5. To determine differences in adjustment between those with differing strengths of just world beliefs.

6.3 DISCUSSION OF MAIN STUDY FINDINGS AND CONTRIBUTIONS TO THE LITERATURE

6.3.1 The Role of Cause, Responsibility and Blame Attributions in Pain

The first aim was based on the shortcomings of attribution literature in pain/illness/injury samples. Four shortcomings were addressed. Firstly, there is a lack of research empirically distinguishing between cause, responsibility and blame. This is important on both a conceptual and empirical level. Conceptually, it means that empirical distinctions between the concepts have fallen behind theoretical distinctions. Empirically, it limits what can be learned about whether or not the concepts are distinguished from each other, and thus if it is important to examine all three concepts independently in pain situations. There were also practical implications of this, related to the second criticism of attribution research. That is, despite having been theoretically distinguished from each other, researchers often use the concepts interchangeably. This creates problems in interpreting the nature of any attribution/adjustment associations found in studies, and thus, which types of attributions result in poor adjustment to pain.

The third criticism concerns the structured nature of attribution measures. Causal attribution measures are often unstructured, allowing participants to make any or no causal attributions at all (Chapter 2, section 2.2.3.5). However, the structured nature of responsibility and blame measures often fail to give people the option to refrain from making these attributions. Additionally, they largely dictate the types of attributions that can be made. This is important to address because it limits what can be learned about the extent to which pain sufferers make responsibility and blame attributions about their pain, and the nature of these attributions made.

The final criticism of attribution research in pain/illness/injury samples is that there is a lack of longitudinal research examining the extent to which cause, responsibility and blame attributions change over time. Conflicting findings have emerged among the limited available literature that has investigated this, producing no firm indication about whether or not attributions do change over time. This is important to address for two reasons. Firstly, the variable nature of pain suggests that a person's beliefs about his/her situation may change over the course of pain. Secondly, pain may last for several years, and as such it cannot be expected that beliefs about it will remain stable over time.

In order to address these four criticisms of attribution research, cause, responsibility and blame attributions were measured as questions in the semi-structured interview schedule (see Chapter 4, section 4.3.3.7 for a full justification of the questions). Definitions of each concept were provided to make distinctions between them. These distinctions, and the attribution questions that accompanied them, were worded in such a way that they would not limit the participants in whether or not they made attributions, and the types of attributions made. At least two attribution questions accompanied their corresponding definition in the interview schedule. One question measured attributions made for the pain onset, while the other question measured attributions for the pain now. The aim of this was to examine whether attributions changed for different times in the pain experience. The interview schedule also measured motives for making causal attributions, involving questions relating to knowledge and uncertainties about causes of the pain (Chapter 2, section 2.2.3.5). Investigating attributions in this way contributed to the exploratory nature of the study, because no literature has been found to investigate them in pain in the same way as the present study.

In terms of the results produced, the majority of the participants made causal attributions for their pain onset, while around half of the sample attributed responsibility and just under half attributed blame for this time. The fact that the majority of the participants made causal attributions for their pain onset supports two things. Firstly, the estimated 69-95% of illness patients who attribute causes for their illness onset (Turnquist et al, 1988). Secondly, the extent to which causal attributions were made for the onset of illness in the studies reviewed in Chapter 2. These percentages are based on disease-specific samples drawn from specialised treatment centres. In the present study the percentages were based on community pain sufferers suffering from mixed pain complaints. This suggests that regardless of disease type or recruitment method, people largely do attribute causes for their pain or illness situations. Additionally, the fact that up to half of the participants attributed responsibility and blame for the onset of their pain when given the opportunity not to do so contributes to a literature lacking in free response measures. In particular, responsibility and blame measures typically either provide response options from which participants must select attributions, or allow participants to refrain from making attributions only in relation to that being measured e.g. making attributions to the self or not (Chapter 2, section 2.2.3.7). Attributions to chance factors are commonly made using the first measure, and no attributions are commonly made using the second measure. Both suggest a tendency to refrain from making attributions. This was partially supported in the present study by the finding that around half of the participants did not attribute responsibility and/or blame for their pain onset.

There are two possible explanations for this. Firstly, it may not have been relevant for some of the pain sufferers to attribute responsibility and blame for their pain. The literature reviewed in Chapter 2 largely discussed responsibility and blame in the context of people who have been injured as a result of accidents. These are situations that may warrant the making of responsibility and blame attributions more than, for example the onset of arthritis or some other disease-related pain condition. Secondly, even where pain situations may have warranted the making of responsibility and blame attributions, some participants may not have made them because they would have felt uncomfortable doing this, viewing it as a socially undesirable thing to do. In support of this, some of the literature reviewed in Chapter 2 suggested that people may be motivated to refrain from attributing responsibility and blame for this reason (Lloyd-Bostock, 1991). The fact that people do refrain from making attributions suggests that future measures of responsibility and blame should not restrict participants in the types of attributions they can and cannot make.

However, some participants did attribute responsibility and blame for their pain onset. These results make two important contributions to the illness/injury literature in general and pain literature in particular. Firstly, they demonstrate that people do make these attributions when given the opportunity not to do so. Secondly, they indicate that making responsibility and blame attributions may be important and/or relevant for some pain sufferers. Given the high incidence of causal attributions, it may also be important and/or relevant for the pain sufferers to attribute a cause for their pain onset. Chapter 2 (section 2.2.3.5) considered other reasons why attributions may be made, involving various motives for making them. Specific motives, namely knowledge and uncertainty were unrelated to causal attributions, suggesting that it is more likely that attributions were made out of importance or relevance to individual pain situations, rather than because of particular motives. These individual pain situations may include demographic variables, because Chapter 5 (section 5.3.1.7) found demographic differences in the attributions made among the pain sample.

Other potential influences on whether or not certain attributions are made include dispositional factors. For example, people who believe that they are in control of their pain might not choose to attribute responsibility or blame to anyone, and instead refrain from making these attributions. This supports the idea suggested in Chapter 2 (section 2.2.2) that people tend to have their own "attributional style", a particular way of explaining events in their lives. While this is possible, in the present study, given that individual differences in attributions emerged, it seems more plausible that attributions were made out of relevance to individual pain situations, rather than dispositional factors.

Similar numbers of participants attributed cause, responsibility and blame for the pain now, as the pain onset. On the surface, the fact that people made current attributions for their pain contributes to a literature largely concerned with retrospective attributions. However, an examination of the nature of the attributions made for the pain now, revealed that largely the same attributions were made for this time, as the pain onset. This suggests that there is little value in measuring current pain attributions, because the pain sufferers did not change their pain attributions over time.

There are two possible explanations why attributions did not change. Firstly, this may have been a function of the questions asked. The participants were asked about attributions for the pain onset and now at the same time. This may have led them to produce similar responses, without having time to think between the questions. Perhaps a different method using a longitudinal investigation would have produced different results. However, given time constraints, it was not possible to conduct a longitudinal investigation in the present study. Secondly, attributions may be unimportant for the current pain experience, leading to the same attributions for the pain onset being repeated for now (Mumma and McCorkle, 1982-83). In support of this idea, as indicated in Chapter 5 (section 5.3.1.2), some participants reported their pain to be "just there" now, but had given a causal attribution for the pain onset. An examination of individual differences indicated that these participants had suffered pain for over nine years' duration (section 5.3.1.7), suggesting that the longer the length of time since diagnosis, the less important attributions may be. The fact that attributions did not change supports the limited available literature reviewed in Chapter 2 (section 2.2.3.8), that found causal attributions do not change over the course of the acute illness experience, and extends it to the chronic pain experience.

In terms of the nature of the attributions made, four thematic categories emerged from a qualitative analysis of the pain attributions made across cause, responsibility and blame questions, for both time periods. The first category, "Physical Internal Attributions", involved attributions to physical internal states, and was characterised by two main themes. The first, "Condition Specific" theme, was dominated by attributions to either the symptoms or the name of a condition. There was some indication that people who made attributions to the symptoms of their condition had suffered pain for a longer duration (up to 15 years), than those who made attributions to the name of their condition (up to seven years). Attributions to hereditary factors were made within the second, "Genetic" theme, and there was some indication that these were made in the absence of an alternative explanation for the sudden onset of pain.

The second, "Physical External Attributions" category was characterised by attributions to environmental factors, and two key themes emerged from the pain attributions made. The first, "Incidents/Accidents" theme was dominated by attributions made by back pain sufferers that falling over in a range of situations, and being involved in straining activity, such as over-stretching and twisting led to the development of their pain. Back pain sufferers also made attributions within the second, "Lifestyle" theme, to the strenuous nature of their employment, involving lifting, bending, and standing, which they felt contributed to their pain. Together, these responses suggest that people suffering from back pain conceptualised their pain in terms of various types of strain. The "Lifestyle" theme also involved reports by older participants i.e. aged 60 years or over, that previous lifestyle factors such as diet, and unhealthy behaviours such as smoking and drinking alcohol, led to the onset of their pain several years later.

The responses within the "Physical Internal" and "Physical External" categories suggest that individual difference variables such as pain duration, age, and type of pain may influence the attributions made for pain. Although this is not new in and of itself, it does contribute to a literature that scarcely mentions factors influencing the attributions that people make for a variety of conditions. There is little against which to compare the responses, given the fact that pain attributions have scarcely been examined before. However, the types of attributions made, for example to lifestyle factors, the environment and hereditary factors, by people suffering from various types of pain, including arthritis, reflect those made in other arthritis samples (Chapter 2, section 2.2.3.7).

Attributions made within the category, "Attributions to the Self", also supported those made in the illness literature. Two main themes emerged from the responses within this category. These were "Omissions" and "Inappropriate Activity", and involved a failure to do certain things, such as avoid potential hazards, look after the self properly, and obtain treatment for the pain condition, as well as maintain unhealthy behaviour such as smoking, work too hard, and lift heavy objects. These attributions are similar to those made in other, cancer samples for their illness onset, including past behaviours, one's own negligence, and a failure to preserve one's health (Abrams and Finesinger, 1953; Bard and Dyk, 1956; Moses and Cividali, 1966).

The fourth category, "Attributions to Others" comprised four themes. The first two were small themes, and involved attributions to "Husbands" for inducing stress that resulted in pain, and "Bosses", for failing to take appropriate action to prevent employees being injured. The third theme, "Outsiders" involved attributions to a range of people not known to the participants, such as offenders and patients for attacking the participants, or drivers of vehicles who typically either knocked the participants over, or were involved in vehicle collisions with them. People who made these attributions were suffering from upper body pain, such as neck pain. Within an examination of individual differences in attributions, these participants emerged as most likely to make attributions to other people for their pain onset (Chapter 5, section 5.3.1.7).

No negative emotions were reported towards these other people, despite obvious reports of negligence resulting in pain. This was also characteristic of the fourth theme, "Scientists", which was the most common of all themes involving attributions to others. This involved attributions to a range of medical professionals including General Practitioners, surgeons, and physiotherapists for negligence associated with treating or failing to treat pain. Most of these attributions were for surgical treatments that were perceived to have gone wrong, worsening the existing pain problem. Making attributions such as these to medical professionals is not uncommon (Church and Vincent, 1996; Eccleston et al, 1997), and it has been suggested that attributions to authority figures such as medical professionals increase when they were present at the time of the incident (Tennen and Affleck, 1990). However, what is surprising is that there were no reported negative emotions towards them, and there was even some indication of remorse at making such an attribution. This contrasts the suggestion that these attributions can lead to poor adjustment because they lead to the belief that doctors are fallible, and increase feelings of being unprotected by the people who are supposed to protect them (Church and Vincent, 1996).

There are two possible explanations for this lack of reported negative feelings towards other people in general and medical professionals in particular. Firstly, for a large number of participants the onset of pain occurred several years earlier, and so it may be possible that any negative feelings resided with time. Secondly, given the ongoing nature of their pain, many participants would still be reliant on medical professionals for their pain treatment, and so to avoid feeling any dissonance that might result from an inconsistency between their attitude (negative feelings) and behaviour (attending for treatment), they simply avoided reporting feeling negatively.

Although each of the "Physical External", "Physical Internal", "Self", and "Others" thematic categories emerged across cause, responsibility and blame, responses within the "Self" and "Others" categories were more common as responsibility and blame attributions. This support's Shaver's (1985) Theory of Blame Assignment, which states that responsibility and blame must be attributed to people (Chapter 2, section 2.2.3.3). It also supports the structured nature of responsibility and blame measures (Chapter 2, section 2.2.3.5), by demonstrating that these attributions are made to the self and other people. Attributions to the "Self" and "Others" are not commonly made in the causal attribution literature. Their mention in the present study is likely to be a function of the nature of the causal questions in the interview schedule, which asked participants *who* or *what*, if anything they believed caused their pain onset/now. This contrasts existing causal attribution measures that tend to investigate causes in general, without indicating any nature of the cause. Despite this, responses within the "Physical External" and "Physical Internal" categories were more common as causal attributions.

Differences in the frequencies of the attributions made across cause, responsibility and blame, combined with differences in the number of each type of attribution made, suggests that the pain sufferers descriptively distinguished cause from responsibility and blame, but not these latter two types of attributions from each other. On a statistical level, however, these distinctions were not so clear-cut. Strong associations were found between all three concepts, although these generally tended to be stronger between responsibility and blame, than between responsibility or blame, and cause. The limited available literature statistically distinguishing between all three concepts, in non-pain situations, has conflicted in their interpretation of high correlations between the concepts. Some literature has interpreted this as a reflection of the indistinguishable nature of the concepts (Borek and Shaver, 1988; Sholomskas et al, 1990). Other literature has interpreted this as reflecting the close, but distinct nature of the concepts (Critchlow, 1985; Mantler et al, 2003). This latter interpretation is consistent with Shaver's (1985) Theory of Blame Assignment that proposes all three concepts to be closely related but distinct. This interpretation of the concepts seems more plausible when considering that, as in the present study, Mantler et al (2003) found differences in the magnitude of the attributions made, with more cause than responsibility and blame, and more responsibility than blame attributions being made.

Together, both the descriptive and statistical analyses suggest that cause is more distinguishable from responsibility and blame, than these attributions are from each other. This indicates that it is at least worthwhile to measure causal attributions in pain separately from responsibility and blame, although it may not be worthwhile to measure these latter attributions as separate components. The fact that the nature and number of responsibility and blame attributions made were so similar, despite definitions being provided of each, supports the point made in Chapter 2 (section 2.2.3.3), that even when attribution definitions are provided, people may fail to distinguish between them (Tennen and Affleck, 1990). This may be because people have their own motives for making attributions and ignore the definitions (Shaver, 1992), or because their understanding of the distinctions is different from the conceptually sophisticated distinctions made between them. Indeed, it has been suggested that lay perceivers' conceptual errors in making attributions should be interpreted by researchers (Lalljee, 1981), rather than imposing definitions of attribution concepts.

However, the advantages of defining attribution concepts outweigh any problems associated with them. The first is that it ensures that both researcher and participant have a similar understanding of what each concept means. This is essential because researchers often use cause, responsibility and blame interchangeably in their interpretation of attribution results. This leads to the second advantage, that it may allow the outcome of associations between attributions and other variables to be clearly interpreted. The third advantage is that it might deter future studies from using the concepts interchangeably. For example, the fact that cause was distinguished from responsibility and blame provides the basis for future research to distinguish between the concepts, specifically to stop using cause interchangeably with responsibility and blame.

In summary, this exploratory investigation of attributions in the present pain sample has revealed four main things. Firstly, pain sufferers make attributions for their pain to a range of internal states, environmental factors, themselves, and other people. Secondly, it is more important or relevant for pain sufferers to make causal attributions for their pain, rather than responsibility and blame attributions, although these attributions are important for some pain sufferers, given that around half of the sample made these attributions when given the opportunity not to do so. Thirdly, pain sufferers seem able to clearly distinguish causal attributions more from responsibility and blame, than these latter two types of attributions from each other. This suggests a value in examining causal attributions for pain, but questions the value of measuring responsibility and blame attributions independently in pain. Fourthly, attributions for pain did not change in the present sample. This result may be due to the way in which the changing nature of attributions was measured, and as such requires further exploration using a longitudinal analysis to establish with any certainty whether or not attributions change in pain.

6.3.2 The Nature of Adjustment in Pain

The second aim of the present study was to investigate adjustment to pain. This was achieved using health, psychological and functional outcomes that have been commonly used to measure adjustment to pain/illness/injury situations (Chapter 2, section 2.2.5.2). However, the way in which they were applied took account of some criticisms and methodological differences of research investigating the attribution/adjustment relationship in pain/illness/injury samples, outlined in Chapter 2. One of the criticisms of this literature involved the means by which adjustment was measured in the studies reviewed. That is, the structured questionnaire format of most measures limits what can be learned about adjustment to illness/injury situations in general, and pain in particular (Chapter 2, section 2.3.5). In the present study adjustment was measured in the semi-structured interview schedule using questions to guide each of the health, psychological and functioning outcomes, but allowing participants to define their own adjustment to pain using these outcomes, rather than imposing response categories on them. The aim of this was to learn something about the way in which pain sufferers adjust to their pain. The health-related adjustment questions measured ways in which the participants' pain had been and was being treated and self-managed. Psychological outcomes involved questions measuring emotions towards the pain at its onset, now, and overall since its onset. Functional questions measured both physical and social functioning with the pain (see Chapter 4, section 4.3.3.8 for a full justification of the questions).

Chapter 2 (section 2.3.6) also reported that variations in the timing of the attribution/adjustment relationship might contribute to the mixed attribution/adjustment associations found in the literature reviewed. In order to explore the variable nature of this relationship, it was investigated for different times in the pain experience. Questions measuring emotional adjustment for the pain onset and now were developed in the interview schedule using the same criteria as that for measuring attributions for these times (Chapter 4, section 4.3.7). Emotional adjustment was examined for change because there is some indication in the literature that emotions may change across the pain experience (Church and Vincent, 1996).

With the exception of Church and Vincent (1996), none of the studies reviewed in Chapter 2 allowed pain sufferers to define their own adjustment to pain. Additionally, none of the studies examined adjustment to pain/illness/injury for more than one time period. The fact that the present study does both of these things contributes to the exploratory nature of the study.

In terms of health outcomes, various ways of treating and self-managing the pain were reported. The most commonly reported treatments were oral medications, physiotherapy, complementary treatment and surgery. Additionally, both physical (rest, exercise, heat) and psychological (distraction, mind-over-matter) self-management techniques were reported. In terms of psychological adjustment, a range of negative emotions and positive statements were reported towards pain, for each of the pain onset, now and since time periods. The fact that participants reported feeling positively as well as negatively towards their pain contributes to a literature largely concerned with investigating the extent of negative emotional adjustment to a situation.

There were changes in the nature of negative emotions and number of the positive statements reported towards the pain across each time period. Although statistically non-significant, descriptive analyses suggested that particular negative emotions were more commonly reported at each time period. General upset/distress and shock/disbelief were commonly reported emotions towards the pain at its onset, as the participants tried to understand what had happened to them. There were more reports of irritation/frustration and hatred/resentment towards the pain now, because the pain had not resolved, and concerns were expressed about one's future with pain. Since the pain onset, the participants more frequently reported depression and feeling down, largely due to the limitations placed on their lives by the pain. Similar reports of feeling shock at the pain onset, and anger and sadness after the onset have been made in other chronic pain sufferers experiencing pain of a similar duration (Church and Vincent, 1996). This provides some support for the validity of the present exploratory finding.

In terms of the number of positive statements made towards the pain, many more participants reported feeling positively towards their pain now and since the pain onset, than at the pain onset. Current positive statements included a general acceptance of and coping with the pain, combined with a refusal to let pain get one down overall since its onset. Reasons for these positive statements included accepting that the pain will not resolve, complying with its limitations, and acknowledging that things can still be done, despite the pain.

These changes in the nature and number of attributions made support the assertion that adjustment may change at different times in an illness/injury experience. Turnquist et al (1988) proposed that at the onset of these situations, issues of emotional adjustment are strongest, while issues of functioning become more important during recovery. The present study did not investigate whether different types of adjustment change over time, but did find that emotional adjustment may change in emphasis over time. Turnquist et al's (1988) assertions were based on longitudinal analyses and the present findings were based on reports of adjustment *for* two different times being made *at the same time*. Longitudinal analyses are required to determine whether the same results would be produced over time. However, the fact that similar types of emotions were reported in longitudinal investigations with other chronic pain samples (Church and Vincent, 1996) supports the idea that this might be the case.

The results of an examination of individual differences in adjustment suggested that the methods used to treat pain might influence the way in which people feel towards their pain. In particular, there was some indication that using psychological strategies such as distraction and mind-over-matter techniques to self-manage pain might be linked to current positive feelings about pain, because the arthritis sufferers in the sample reported both types of adjustment more than the other type of pain groups. Additionally, the back pain sufferers of the sample reported feeling more negatively towards their pain at interview than the other type of pain groups, and more frequently reported receiving physiotherapy to treat their pain. Together, these results suggest the possibility that self-managing pain in general, and using psychological self-management techniques in particular, might be linked to positive feelings towards pain, while failing to self-manage pain, or receiving physiotherapy might be linked with feeling negatively towards pain.

In terms of physical and social adjustment to pain, more participants reported ways they had been limited by their pain, rather than ways they had adapted to it. These were largely concerned with an inability to carry out social/leisure and daily activities, such as their employment. This concern with employment supports the use of structured measures of work functioning as adjustment indicators in illness studies (Bar-on, 1987). Some participants also reported an inability to carry out such daily tasks as doing shopping and household chores. Daily functioning and living skills have been used as structured adjustment measures in illness samples (e.g. Berckman and Austin, 1993; Lowery et al, 1983). The fact that these issues emerged through interview supports their use as measures of adjustment to illness, as well as providing some support for the validity of the present exploratory findings.

The use of independent adjustment outcomes has been criticised on the basis that they create problems in evaluating the overall adjustment of one person (Michela and

Wood, 1986). However, the aim of the present study was not to evaluate overall adjustment, but to investigate adjustment to pain in specific domains. The fact that all three health, psychological and functioning outcomes were not associated with each other supports the idea that they are independent domains.

6.3.3 The Nature of the Attribution/Adjustment Relationship in Pain

The third aim of the study was to investigate the nature of the relationship between cause, responsibility and blame attributions, and adjustment to pain. There were five parts to this aim, based on the literature reviewed in Chapter 2 on the nature of the attribution/adjustment relationship in pain/illness/injury situations. Firstly, conflicting findings have emerged about whether or not there are differences in adjustment between those who make causal attributions, and those who do not. The literature has also produced mixed findings about secondly, the adaptive nature of causal attributions in general, and thirdly, the adaptive nature of attributing responsibility and blame to the self. These three conflicting findings were investigated in the present study using the mixed community sample of pain sufferers. Fourthly, consistent findings have suggested that attributing responsibility and blame to other people results in poor adjustment to pain/illness/injury. Whether or not making these attributions resulted in poor adjustment to pain was investigated in the present study.

The fifth part of the aim involved the timing of the attribution/adjustment relationship. The literature reviewed in Chapter 2 (sections 2.3.2.4 and 2.3.3.5) has suggested that there may be more of an attribution/adjustment relationship when both are investigated for the same time, than when attributions made for the onset of a condition that occurred years earlier are paired with current adjustment to the situation. The variable nature of the attribution/adjustment relationship was addressed in the present study, through investigating their associations both at the same time and for different times in the pain experience. The development of questions in the semi-structured interview schedule to measure attributions and adjustment for different times in the pain experience allowed for this analysis to be conducted.

The fourth aim was addressed using the attribution and self-defined adjustment outcomes outlined in sections 6.3.1 and 6.3.2. The fact that the present study used adjustment outcomes defined by the pain sufferers, while the literature reviewed in Chapter 2 used standardised adjustment questionnaires in their associations with attributions, contributes to the exploratory nature of the present study. This is because no literature has been found to associate self-defined adjustment with attributions in pain.

Additionally, the present study was exploratory because of the time frames of the attribution/adjustment relationship investigated. The literature reviewed in Chapter 2 largely investigated associations between retrospective attributions and current adjustment to pain/illness/injury. This time frame was also adopted in the present study, along with two additional time frames. These involved attributions and adjustment being paired for the same time period, i.e. the pain onset, and now. Although by the short-term nature of the acute illness experience, the attribution/adjustment relationship has been investigated for similar time frames in acute illness situations (see Chapter 2, section 2.3.2.3), it has not been investigated for the same time in the chronic illness experience. This again, contributes to the exploratory nature of the study.

The results produced five main outcomes in relation to each parts of the aim. Firstly, there were no differences in the ability to predict adjustment between those who made and did not make causal attributions for their pain now. Despite the different time frames adopted in the current analysis and in the literature (see Chapter 4, section 4.5.4), the present findings support those of literature which have found no differences in adjustment between those who do and do not make causal attributions. This has occurred in arthritis (Lowery et al, 1987), and breast cancer samples (Lavery and Clarke, 1996; Lowery et al, 1993; Taylor et al, 1984).

However, the current results fail to support evidence from other arthritis (Lowery et al, 1987), myocardial infarction (Lowery et al, 1987), and acute surgical illness patients (DuCette and Keane, 1984). This literature suggests that people who make causal attributions for their illness are better adjusted to their situation than those who do not. These contradictory findings may be due to variations in the samples employed across studies. For some patients (largely breast cancer) there were no differences in adjustment between those who made causal attributions and those who did not. This may be because causal attributions were not important for this sample. Indeed, it was suggested that issues of control were important for adjustment to breast cancer, rather than attributions (Taylor et al, 1984). For other, acutely ill myocardial infarction and surgical samples, causal attributions may be more important for recovery, making these attributions more adaptive than not making them. In support of this, some evidence has found positive associations between causal attributions and subsequent health behaviour change following a myocardial infarction, to offset another myocardial infarction (DeValle and Norman, 1992). To the extent that differences in adjustment between those who make/do not make causal attributions is a function of the importance of making causal attributions, the results of the present analysis suggest that causal attributions were not relevant or important for the pain sufferers' adjustment to their pain.

Support for this idea comes from the second main finding, that few causal attribution/adjustment associations were found at all. Of those found, responses within the category, "Physical External Attributions" for the pain onset were weakly but positively associated with negative emotions for the pain onset. This association makes sense when considering that some of the attributions within this category involved sudden incidents or accidents, such as straining the self, or falling over (section 5.2.4), both of which might be expected to lead to the negative emotions general upset/distress or fear/worry (Chapter 5, section 5.3.1.2) at the onset of pain. Although different time frames were adopted here, and in the literature reviewed in Chapter 2, in general these results support the associations found between causal attributions and poor emotional functioning in a variety of illness samples (Faller et al, 1995; Lowery et al, 1983; Meana et al, 1999).

The category "Physical Internal Attributions" was also associated with adjustment outcomes. Specifically, "Physical Internal Attributions" for the pain onset were positively associated with receiving physiotherapy treatment. This association makes sense when considering that some of the attributions made within this category were to symptoms of "wear and tear", that might require physiotherapy (Chapter 5, section 5.2.3). To date no literature has been found to associate causal or any attributions for pain with physiotherapy or any other treatment for pain. This may be attributable to the fact that the treatment was defined by the pain sample, instead of being investigated using a standardised measure. Additionally, "Physical Internal Attributions" for the pain onset were weakly but positively associated with reports of support from the family, and approached significance in being associated with reports of one's social life having adapted to pain. Again, these causal attribution/adjustment associations have not been found elsewhere because the pain sufferers themselves defined their own specific adjustment outcomes, but they do suggest that responses within this category are adaptive for adjustment to pain, while responses within the "Physical External Attributions" category result in poor adjustment to pain. An examination of the nature of the attributions made indicated that this might be the case because attributions within the "Physical Internal" category were made to factors that could be considered to be outwith the control of the participants, such as genetic factors (Chapter 5, section 5.2.3), suggesting that the onset of pain could not have been prevented by the individual. However, the attributions made within the "Physical External" category were more controllable, e.g. being made to leisure activities, straining activity (Chapter 5, section 5.2.4), meaning the participants had some role to play in the development of their condition, and this might result in poorer adjustment to pain.

The third main finding of the analysis was that attributing blame within the category "Self", for the pain now was weakly but positively associated with reports of more positive than negative feelings being reported overall since the pain onset. These attributions might be adaptive because they were controllable, in that the participants could have avoided bringing harm on themselves by, for example, taking care of themselves, not indulging in inappropriate activity and avoiding lifting heavy objects that might cause harm (Chapter 5, section 5.2.5). Part of this control involves the knowledge that one can avoid inflicting further pain through avoiding such activities, and this way making such attributions is adaptive. This contrasts the maladaptive nature of the controllable "Physical External Attributions" because these latter attributions were not made to the self, and as such there is no direct link to the future avoidability of harm, i.e. the self avoiding pain-inducing activity.

The fourth finding was that attributing responsibility within the category "Others" for the pain now was positively associated with more negative than positive feelings reported towards the pain overall since its onset. There are several reasons why making attributions to others might lead to poor adjustment (Chapter 2, section 2.3.3.8). One important reason is that by their nature they suggest that pain sufferers have no control over the pain inflicted upon themselves, and are unable to control the possibility of future harm being inflicted by others. It is this that is maladaptive.

Additionally, most of the attributions within the category "Others" for the pain now were to medical professionals for various acts of negligence in the treatment of pain, from the time of its onset, to interview (Chapter 5, section 5.2.6). These attributions in themselves might lead to the feelings of depression and "feeling down" reported towards the pain overall since its onset (Chapter 5, section 5.3.2.1), because they suggest a failure of the people relied upon by the pain sufferers to treat their pain. Although there were no reported negative feelings towards the medical professionals (section 6.3.1), the fact that these attributions were associated with negative emotions suggests the possibility that they were more emotive than reported.

Interesting subgroup effects emerged within the adaptive/maladaptive attribution/adjustment associations. Specifically, the self-blame/positive feelings association was particularly significant for the employed participants, while the other-responsibility/negative emotions association was particularly significant for the retired, and divorced participants of the sample. These effects can be explained in different ways. Being employed creates the opportunity for interacting with others who might be able to provide support. This might lead to an environment in which a person feels able to take positive control of his/her life through perhaps being able to blame him/herself, in the absence of feeling threatened by others, and this in itself could be adaptive for adjustment to pain. However, retirement and being divorced suggest the possibility of a lack of support from other people, through perhaps having less social contact. This could lead to feelings of being under threat by others, resulting in making these attributions being maladaptive for adjustment to pain.

Despite the differing time frames of the current analysis, and the literature reviewed in Chapter 2 (see Chapter 4, section 4.5.4), together both suggest that self-blame attributions are adaptive, and attributing responsibility to others results in poor adjustment to pain/illness/injury. In particular, the current results support reports of self-blame attributions being associated with low negative affect (Delahanty et al, 1997; Lambert and Falconer, 2001; Moulton et al, 1987), and other responsibility/blame attributions being associated with high negative affect (Church and Vincent, 1996; DeGood and Kiernan, 1996).

The fifth part of the aim was to determine whether or not the attribution/adjustment relationship varied for different times in the pain experience. Those few attribution/adjustment associations found made it difficult to consider this relationship. This is because a large number of the associations were between attributions and health, specifically treatment outcomes, which can be received throughout the course of a pain experience, not necessarily at any one time. Some associations were found, however, between attributions and adjustment reported for the same time period, across an analysis of all five aims. This provides some support for the suggestion made in Chapter 2 (section 2.3.3.5), that attributions and adjustment interact with each other when made for a similar time period. However, given the few attribution/adjustment associations found overall, no conclusions can be drawn from these results about whether or not attributions and adjustment better associated with each other at some times in the pain experience more than others.

One other suggestion was made in Chapter 2 about when in the pain/illness/injury experience the attribution/adjustment relationship is strongest and most adaptive. Some literature has suggested this may be around the onset of a pain/illness/injury situation i.e. up to one year after the onset (Bulman and Wortman, 1977; Delahanty et al, 1997; Lambert and Falconer, 2001; Moulton et al, 1987). However, other literature has suggested attributions may be more adaptive the longer the length of time since diagnosis, i.e. longer than one year after the initial onset of the condition (Glinder and Compas, 1999; Malcarne et al, 1995). In the present study, the fact that few attribution/adjustment associations were found in a pain sample whose mean pain duration was 8.15 years, suggests that attributions may have fewer associations with adjustment the longer the length of time since diagnosis.

In summary the results from the analysis of the attribution/adjustment relationship in pain suggest several things. Firstly, the fact that attributions were largely unrelated to adjustment indicates that they may be of little importance for adjustment to pain. Some of the literature in Chapter 2 found factors other than attributions to be important for adjustment to disease-specific conditions such as cancer. It may be the case that other factors are important for adjustment to pain. However, there are two factors that might explain this poor association. Firstly, adjustment was measured using interview schedule techniques, rather than standardised measures. It may be that standardised measures would produce more associations because they make use of Likert scales that allow the strength of a relationship to be established, rather than the interview schedule that only determines the presence or absence of a relationship.

Secondly, given the sample size, the data might have been subject to a Type 2 error. A larger sample size might not only have produced more associations, but also increased the power of those found. Both factors suggest that rather than questioning the use of attributions, future research should examine the attribution/adjustment relationship in pain using standardised measures, and a larger sample size.

Secondly, although the measurement of adjustment can be criticised on the basis described above, two interesting attribution/adjustment interactions emerged, that may not have been detected by more structured adjustment measures. Firstly, attributions were often associated with the use of particular pain treatments. This suggests that perhaps pain treatments should be tailored to what people believe about their pain, in order to increase compliance with treatment. Secondly, the fact that participants reported feeling positively as well as negatively towards their pain, and this interacted with attributions, suggests that future research should consider positive adjustment in order to determine the true adaptive nature of attributions, instead of inferring this from their associations with low negative affect. Additionally, the fact that positive adjustment emerged from participant reports of adjustment to pain suggests that there may be a value in allowing particular samples to define their own adjustment, because there may be aspects of adjustment important to them, not detected by more structured measures, that interact with attributions.

Thirdly, of the associations found, some attributions emerged as more adaptive than others. In particular, there was some indication that attributions made within the

"Physical Internal" and "Self" categories were adaptive for adjustment to pain, while attributions within the "Physical External" and "Others" categories resulted in poor adjustment. This suggests that in addition to pain beliefs, further research should consider pain attributions, in order to determine and treat any that might result in poor adjustment to pain.

6.3.4 The Role of Just World Beliefs in the Pain Experience

The fourth aim of the present study was based on the shortcomings of just world research outlined in Chapter 2 (section 2.2.4.7). That is, just world beliefs have not been measured in real-life pain, despite the tremendous challenge the pain experience may present to a sufferer's belief that the world is a fair and just place. This is because it may have a physical, social, economical and psychological impact on an individual. One explanation for this lack of research is that the investigation of just world beliefs and reactions to one's own personal suffering is a relatively new area of research (Hafer and Olson, 1998). Beyond the relevance of measuring just world beliefs in pain, it is important to do this because, like general pain beliefs and attributions, just world beliefs have implications for adjustment to real-life negative personal situations. These have tended to be potentially short-term situations such as the loss of employment (Benson and Ritter, 1990; Ritter et al, 1990), and reactions to poor student grades (Hafer and Olson, 1998). In the present study the just world beliefs of the pain sufferers were measured using the Just World Scale (Rubin and Peplau, 1975) (see Chapter 2, section 2.1.6.3). Given that the measurement of just world beliefs in the present study was exploratory, specific pain variables were considered for their interactions with just world beliefs. In particular, differences in just world beliefs between type of pain and pain duration groups were examined.

The results found the mean just world score to be marginally above the midpoint of the scale, indicating the pain sufferers had some belief that the world is a fair and just place. This score is comparable to that obtained in related, spinal-injured patients (Bulman and Wortman, 1977; Heinemann et al 1988; Kiecolt-Glaser and Williams, 1987), and other, unrelated experimental studies largely comprised of student samples free from pain (Lipkus et al, 1996; Rubin and Peplau, 1975; Tomaka and Blascovich, 1994; Tanaka, 1999). Given this comparability to the just world scores of pain-free samples, it could be suggested that the pain experience did not influence the just world beliefs of the sample. The results indicated this to be the case, where there were no differences in just world beliefs between those with different types of pain. However, this might have been the case because the experience of pain has the same effects on sufferers' life, regardless of the type of pain condition experienced.

There were differences in the strength of the just world beliefs held by different pain duration groups. Those with the shortest pain duration (1 month - 2.5 years) had stronger just world beliefs than those who had pain for between 3 - 9 years' duration. None of the age, gender, employment or marital status demographic variables mediated the effects of pain duration on just world beliefs. Since this is a new finding in the pain literature, there are no readily available explanations for it. One possible interpretation is that during the first few years of pain, the pain is treated in an attempt to resolve it. This may not alter the extent to which the pain sufferers' believe the world to be a fair and just place. However, after this time when it becomes clear that the pain cannot be resolved, and its sufferers will have to learn to live with it, there may be a period of adjustment to the new situation. Part of this adjustment might involve the pain sufferer feeling that it is unfair he/she has to suffer in this way. This may influence the extent to which he/she feels the world is a just place.

However, after a while (nine years in the current sample), it is possible that some people may have accepted and learned to live with their situation, the result of which being that his/her just world beliefs may again be unaffected by the pain experience. Support for this idea of an association between pain duration and positive feelings comes from an examination of individual differences in adjustment. This suggested that those who had suffered pain for over nine years' duration more commonly than the other pain duration groups reported feeling more positively than negatively towards their pain overall since its onset (Chapter 5, section 5.3.2.4).

These results suggest that, as Just World Theory indicates, an individual's just world beliefs may be challenged by the experience of personal suffering. However, the present results indicate that this challenge to just world beliefs is not ongoing throughout the pain experience. It may only occur during periods when an individual feels threatened or victimised by his/her pain. This contributes to Just World Theory, by proposing that just world beliefs may not necessarily be threatened by the negative experience in general, but may be threatened at specific times in the experience, especially if it is long-term.

Beyond contributing to Just World Theory, the above results also contribute to the pain literature, because the just world beliefs of long-term pain sufferers have not been investigated before. On a personal level, the results indicate that a pain sufferers' view of the world is affected by his/her pain experience. This is likely to be attributable to the consequences of pain in terms of the physical, social, economical and psychological impact that pain may have on a person's life (Chapter 2, section 2.1.7).

No individual differences in just world scores were found. This is surprising, because it would be expected that disadvantaged groups, such as people who were unemployed or medically retired would have different just world scores to those who were employed. The fact that this was not the case suggests one of two things. Firstly, people who were unemployed or medically retired did not view their situation in a negative way, perhaps because of any benefits they received, and so their just world scores would not differ from any other employment group. Secondly, the data was subject to a Type 2 error, and the marginally insignificant result found ($p = 0.07$), may have been more significant with a larger sample size, revealing differences between the groups.

In addition to measuring the just world beliefs of the pain sufferers, possible ways of maintaining just world beliefs in the face of personal suffering were considered. This involved the cause, responsibility and blame attributions made in the first aim. Justification for their consideration as possible factors that may help maintain just world beliefs in situations of personal suffering was considered in Chapter 2 (section 2.2.4.4). The results indicated that none of the attributions had a role to play in maintaining just world beliefs. There were no differences in the just world beliefs of those who made causal attributions for their pain and those who did not. This fails to support the reported beneficial role of making causal attributions in maintaining justice beliefs (Kidd and Utne, 1978; Utne and Kidd, 1980). Similarly, the fact that there were no differences in just world beliefs between those who attributed responsibility and blame to themselves versus others for their pain, fails to support the role of attributions to the self maintaining justice beliefs, and attributions to others resulting in feelings of injustice (Montada, 1992). The failure to find responsibility and blame attributions helpful in maintaining just world beliefs may be due to the fact that some pain sufferers made attributions both to themselves and other people for their pain. This suggests the participants would not be making these attributions as a means of maintaining their just world beliefs.

The fact that attributions and just world beliefs did not interact with each other at all in the present study suggests that they are different types of beliefs. However, the small sample size may have restricted their interactions. Future research into their interactions, using a larger sample size may produce different results, and indicate that certain pain attributions do interact with just world beliefs.

6.3.5 The Nature of the Just World Belief/Adjustment Interactions in Pain

Section 6.3.4 highlighted the importance of measuring the just world beliefs of pain sufferers. This included the fact that just world beliefs have implications for short-term negative personal situations, such as the loss of a job, and as such may also be expected to have implications for longer-term negative situations, such as pain. This was explored in the present study's fifth and final aim. Just world beliefs were measured using the Just World Scale (Rubin and Peplau, 1975), and the pain sufferers' scores on this were split into high, medium and low just world beliefs based on percentile ranges. These groups were investigated for differences in the self-defined adjustment outcomes. This was exploratory not only in terms of the fact that differences in strengths of just world beliefs have not been investigated before in situations of adjustment to pain, but also because of the self-defined nature of adjustment in the present study.

The results produced no differences in health, psychological, physical and social adjustment to pain between those with stronger, medium and weaker just world beliefs. This contradicts the results of previous experimental and real-life studies. These studies have found differences in that stronger just world beliefs have been found to be both more adaptive (Benson and Ritter, 1990; Lipkus et al, 1996; Ritter et al, 1990), and less adaptive (Hafer and Olson, 1998), than weaker just world beliefs.

There are two possible explanations for these differences. The first point involves the timing of this relationship. In the experimental and real-life research reviewed above, just world beliefs were investigated in the face of a short-term negative situation. In the real-life situations this involved the loss of a job (Benson and Ritter, 1990; Ritter et al, 1990). However, in the present study the adaptiveness of different strengths of just world beliefs was investigated in a longer-term negative person situation. It may be that stronger just world beliefs have more implications for adjustment to a negative personal situation on a short-term than long-term basis.

The second point involves the nature of the adjustment measures. In the literature reviewed in Chapter 2, standardised adjustment measures were used. This allows just world beliefs to be graded along varying intensities of the adjustment measure. For example, stronger just world beliefs have been associated with less depression than weaker just world beliefs (Lipkus et al, 1996). This was not possible to determine in the present study because the participants defined their own adjustment, creating categorical data. All that could be determined was whether or not different strengths of just world beliefs differed in their associations with the adjustment outcomes.

It has been suggested that high just world beliefs are adaptive, because they help a person deal with daily struggles (Dalbert, 1998). This being the case, future research using standardised adjustment measures might reveal more differences in adjustment to one particular daily struggle, pain, between those with high, medium and low just world beliefs. Specifically, there is a need to establish whether people who have higher just world beliefs adapt better to their pain in terms of, for example, accepting what they have to live with, functioning better, and doing more to self-manage their own pain, rather than being dependent on medical professionals. This would be useful to know in order to target for cognitive-behavioural treatment not only people who have maladaptive beliefs about their pain, but also pain sufferers who view the world as unfair.

6.4 EXPLORING INTERACTIONS BETWEEN PAIN AND MAIN STUDY VARIABLES

The previous section presented the results of the analysis of the five aims outlined in Chapter 3. This section will present the results of an exploration of interactions between the main study variables, and one important variable associated with the study sample, pain intensity. Pain intensity for three different times in the pain experience: present pain, usual pain and pain when at its worst, was measured using the Short-Form McGill Pain Questionnaire (Melzack, 1987) (see Chapter 2, section 2.2.4.5).

The results indicated that the present, usual and worst pain intensity scores were significantly different from each other, being lower at the time of the interview, and higher when at its worst, as would be expected. No other studies have been found to use the Short-Form McGill Pain Questionnaire to measure usual and worst pain intensities as in the present study. However, the mean present pain intensity score obtained is comparable to current pain intensity reports in other pain samples involved in medical accidents (Church and Vincent, 1996), and suffering from cancer pain (Dudgeon et al, 1993). This provides some support for the validity of the current findings.

There were two reasons for investigating current, usual and worst pain intensity reports in the present study. Firstly, to understand pain intensity at different times in the pain experience. Secondly, to ensure as far as possible that the participants gave accurate pain intensity reports. This may be less likely to happen where only current pain reports were investigated and participants were keen to convey the extent of their pain. The fact that all three pain scores were significantly different from each other suggests two things. Firstly, that it is likely the participants were being honest in their pain reports, since they did not report pain intensity at the time of the interview to be high. Secondly, it suggests that the participants' memories for their pain intensities were fairly accurate, given that it would be expected that pain levels on a usual day would be significantly lower than when the pain was at its worst.

The pain scale scores obtained were consistently higher than their corresponding combined sensory and affective word scores. This may be because some of the pain descriptors were not used, either because they were not relevant, or because the participants did not understand their meaning. In support of this, there was some confusion concerning the meaning of such words as "splitting". This was introduced into the short-form McGill Pain Questionnaire to describe types of dental pain, which none of the participants experienced. This would create a lower overall pain descriptor score against which to compare a higher pain scale score. One additional interpretation of these results is that the participants found it easier to describe their pain in quantitative rather than qualitative terms.

However, despite these explanations for inconsistent scores, all three of the present, usual and worse pain scale scores were significantly correlated with their corresponding combined sensory and affective score. This may be explained in terms of the fact that regardless of the scores obtained, they were made for the same time period, and so they would be expected to be correlated with each other.

To explore interactions between pain intensity and the main study variables, only usual pain intensity was considered, because this best represented the participants' pain experiences. The overall pain descriptor rather than pain scale score was used in this analysis, because it presented a more detailed evaluation of the sensory and affective components of pain intensity. Exploratory analyses revealed several things. Some individual differences in usual pain intensity emerged. The main differences involved pain duration and marital status groups. In terms of pain duration, those with pain for between three to nine years' duration had significantly higher usual pain intensity scores, than those with pain for over nine years' duration. Gender mediated the effect of pain duration on usual pain intensity, and although not significant, suggested that males with pain for between three to nine years' duration had higher pain scores than males with pain in the other pain duration groups, and all three female pain duration groups. This finding is interesting when considering that people with pain for three to nine years' duration also had weaker just world beliefs than those in the other pain duration groups. Although gender did not mediate the effects of pain duration on just world scores, together these results suggest that the most problematic period in pain appears to be this middle time period, especially for males. As stated in section 6.3.4, this could be because pain has continued longer than expected, and there might be realisation that it will not disappear, perhaps combined with a refusal to accept this fact. A result of this could be feeling that life is unfair, and increased negative emotions that perhaps are vented more in males than females, increasing pain intensity. Although it has to be acknowledged that this can be the case at any time in the pain experience, at least for the present sample of pain sufferers it appeared to be especially relevant during this time period.

In terms of marital status groups, those who were single had significantly lower usual pain intensity scores, than those who were married, and divorced. Gender mediated the effects of marital status on pain intensity, and within-sex differences were found, where divorced males had significantly higher pain intensity scores, than single males. These results can be interpreted in terms of stress, such that being married and being divorced might be perceived as more stressful than being single, and this, combined with the fact that chronic pain itself has been regarded as a stressful experience (Jensen et al, 1991), could lead to increased pain intensity.

The fact that individual differences in pain intensity emerged, together with the reported physical, social and psychological impacts of pain (Chapter 5, section

5.3.2.1), supports the individual and complex nature of the pain experience. An exploration of differences in adjustment between low, medium and high pain intensity groups revealed differences between these groups in their methods used to treat pain. Of particular interest here is that those with a moderate level of pain were more likely than the other pain intensity groups to report using complementary treatment to manage their pain, while those with the highest pain intensity were more likely to take the advice of medical professionals. These results indicate that in the present study sample, people with moderate levels of pain were able to consider alternative forms of treatment more than people with severe pain. This has potential implications for educating people to self-manage their pain, perhaps highlighting the particular educational needs of people with severe pain.

A surprising result was that the pain intensity groups did not differ in their levels of functioning or emotions reported towards pain. It is reasonable to expect that the reported impacts of pain (see Chapter 2, section 2.1.7) would worsen with increased pain intensity. There are two possible explanations why this was not the case in the present study. Firstly, as has been suggested for a failure to find significant interactions between adjustment and other study variables, the presence/absence nature of the self-defined adjustment in the present study limited the opportunity for adjustment to establish varying degrees of interactions with other variables. A second explanation is that usual pain intensity reports relied on memory estimates of what pain feels like on a usual day. This reliance on memory, combined with the fact that the mean score for the sample was not particularly high (see Chapter 5, section 5.3.6.2), could have reduced the impact this pain intensity might have on adjustment.

An examination of interactions between pain intensity with pain attributions and the just world beliefs of pain sufferers was particularly exploratory, because there is a lack of research investigating the role of both variables in the pain experience. Correlational analyses revealed that just world beliefs and pain intensity were weakly associated with each other. This, combined with the finding that there were differences in the just world scores of pain duration groups, suggests that the beliefs a person has about the world being fair or unfair interacts with his/her experience of pain. This suggests a value in future research examining the role of just world beliefs in pain. Future research ideas are considered in section 6.7.

Attributions were also found to interact with pain intensity. In particular, making attributions to other people for the pain onset was found to predict a small amount of variance in usual pain intensity scores. Although not a large finding, this does suggest that in addition to pain beliefs, which have been found to interact with pain intensity through adjustment (Jensen and Karoly, 1991; 1992; Jensen et al, 1999), the attributions a person makes about his/her pain can predict the intensity of pain he/she experiences. This finding contributes to the earlier finding that making attributions to others was associated with poor emotional adjustment to pain (see section 6.3.3), and together both highlight the maladaptive nature of these attributions in the present pain sample. It is interesting that only attributions to others for the pain onset predicted pain intensity, not now, especially given that most of these latter attributions were made to medical professionals for various acts of negligence. One explanation for this difference is that regardless of incidents since the pain onset, other people created harm in the first place, and it is the pain from this harm that remains with the participants, the knowledge of which perhaps serves to influence their pain intensity. This alone suggests a value in examining pain attributions, in order to target maladaptive attributions for treatment.

In summary, the results from this exploratory analysis of attributions, just world beliefs and adjustment in pain revealed several interesting interactions between these main study variables. These are summarised in Diagram 6.1.

Diagram 6.1: Summary of interactions between main study variables

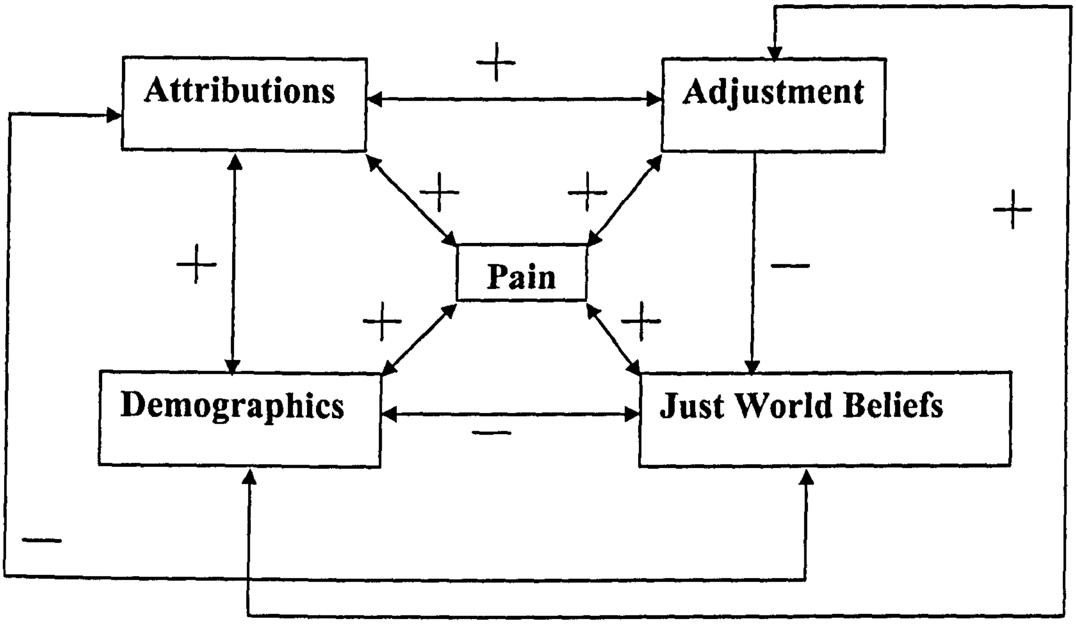


Diagram 6.1 indicates that firstly, attributions interacted with demographic, pain and adjustment variables, but not just world beliefs. Secondly, in addition to attributions, adjustment interacted with pain and demographic variables, but not just world beliefs. Thirdly, just world beliefs interacted with pain, specifically pain intensity and duration, and fourthly, in addition to attribution, adjustment and just world variables, pain also interacted with demographic variables.

6.5 LIMITATIONS OF THE PRESENT STUDY

The present study has four main limitations. Firstly, a large part of the data was collected using a devised interview schedule. There are two main issues associated with this. Firstly, it cannot be ruled out that the questions of the interview schedule may have led the responses given. However, this was controlled for as far as possible with the avoidance of leading questions. Secondly, given the exploratory use of attribution definitions in the present study, it cannot be ruled out that the definitions provided influenced the types of attributions made. Although this may have been the case, the opposite of this may also be true, that the definitions actually clearly distinguished between the concepts, and focussed participants on the types of responses they should provide.

The second limitation is that the Just World Scale completed by the pain sufferers has not previously been validated on pain samples. This questions the reliability of the just world data obtained in the present study. Nonetheless the Just World Scale was found to have adequate reliability for use with the pain sufferers in the present study.

Thirdly, the pain sufferers in the study were largely a self-selected sample, and as such there may have been biases among them that could not be controlled for. For example, the sample was largely female, with 41-60 years being the most frequent age range of the sample. However, in order to avoid potential biases of samples drawn from specialised treatment centres, it was necessary to obtain a sample with as little criteria imposed on it as possible.

Fourthly, the sample size obtained was small, and as such may have compromised the statistical power of some of the results. Additionally, it has to be acknowledged that there is a strong reliability on the chi-square statistic at the 0.05 level in the analysis of the data. However, the exploratory nature of the study allowed this to identify trends between the main study variables, and provide some areas for future research to consider, using a larger sample size.

6.6 IMPLICATION OF THE STUDY FINDINGS

The results of the present study have one main implication for clinicians involved in the treatment of adult pain sufferers with mixed pain complaints. The findings indicated that around one-third of the pain sufferers made attributions for their pain conditions to medical professionals. Most of these attributions were for various interactions the participants had with medical professionals, between their pain onset, and the time of the interview. These included treatments they had undergone, involving surgical procedures, receiving the wrong treatment, and having the symptoms of their condition treated rather than the cause of it. The impression obtained from some of these attributions at the time of the interview is that they may be misguided, due to a lack of knowledge about the ongoing nature of pain. Clinicians should continue to provide patients with information about their pain condition throughout the treatment process, in order to avoid these misperceptions.

6.7 FUTURE STUDIES

Given the exploratory nature of the present study, the research findings have more implications for future studies, than clinical implications. From the results of the study the following studies can be proposed.

1. The reported adaptive nature of strong just world beliefs over weaker beliefs in short-term negative personal situations (Chapter 2, section 2.2.4.6), combined with the fact that in the present study the strongest just world beliefs were characteristic of people suffering from the shortest pain duration (one month – 2.5 years) (Chapter 5, section 5.3.4.3) provides the basis for future research to hypothetically examine the adaptive nature of these beliefs in short-term pain. Specifically, given that the treatment of pain is particularly important at this time in the pain experience, it could be hypothesised that people with strong just world beliefs would have better treatment outcomes than people with weaker beliefs, and as a result would adapt better to their pain after treatment than those with weaker beliefs. In order to test this hypothesis, given the problems associated with the small, community-based nature of the sample in the present study (Chapter 6, section 6.5), a large clinically based sample of newly diagnosed pain sufferers who have not yet received treatment for their pain would be required as the participants of the study. Type of pain would not be relevant, since the present study found no differences in the just world beliefs of different types of pain sufferers. However, all participants would be suffering from potentially long-term conditions such as arthritis, in order to control for the possibility that anticipation of pain resolving completely after treatment might result in positive adjustment after treatment, regardless of just world beliefs. In terms of measures to be employed in the study, it has to be acknowledged that measuring just world beliefs poses problems, because to date no just world belief measures in pain or illness situations exist. In the present study a commonly used and robust just world scale

was used to examine these beliefs in pain. Whilst acknowledging the non-standardised nature of this scale, given that is it robust, and the scale items have achieved some reliability (see Chapter 2, section 2.2.4.5), it is the most appropriate measure of just world beliefs available, until a measure is developed and validated in pain. In terms of adjustment, the literature suggests and the present study found that physical and social functioning, and emotional adjustment to pain are important adjustment outcomes in pain samples. However, the way in which this is measured merits some consideration. In particular, given the potential problems of existing adjustment measures in missing important elements, such as positive adjustment, perhaps new quantified adjustment measures need to be developed and validated on pain samples. Additionally, given the issues that were raised using the Short-Form McGill Pain Questionnaire to measure pain (Chapter 6, section 6.4), in the present study pain would be measured using a short pain scale, such as a 10 or 100-point numerical rating scale. These measures should be applied in the following way. After the diagnosis of a condition, and just before treatment, self-reported just world beliefs would be measured. The sample will then be split using percentile ranges into high and low just world believers. Additionally, pre-treatment pain intensity and adjustment to pain would be measured in order to compare these with post-treatment outcomes, to determine whether or not treatment influenced them in a positive or a negative way. Then, after treatment, using the guidance of medical professionals, the success of treatment could be determined, and pain and adjustment measured, in order to determine two things. Firstly, whether strong just world believers had better treatment success than weaker just world believers, and secondly, whether stronger just world believers had adapted better to their pain than weak just world believers post-treatment, as compared with pre-treatment. Just world beliefs would also be measured post-treatment to determine whether treatment alters these beliefs, and if so, in a positive or a negative way. The importance of this short study is clear through its clinical implications. In particular, to know, for example, that the way people view the world influences their treatment success and adjustment to pain after this treatment, could allow for the prediction of people who might not have a good treatment outcome. The advantage of this for limited resources is that people deemed to have a good outcome could be prioritised for treatment.

2. A second study would require a longitudinal examination of attributions and just world beliefs in pain. In particular, the study results indicated that these beliefs might change across the pain experience. In terms of attributions, although a small finding, there was some indication that they might change across the pain experience (Chapter 5, sections 5.3.1.5 and 5.3.4.3), and some longitudinal and cross-sectional research supported this (Chapter 2, section 2.2.3.8). In terms of just world beliefs, the fact that there were differences in strength of just world beliefs across pain duration groups, suggests that these beliefs might change over time. From these results it could be hypothesised that attributions for pain and just world beliefs would vary at different times in the pain experience. Given this hypothesised change, and the fact that both the present study findings (Chapter 5,

section 5.3.1.5), and the literature (Chapter 2, sections 2.2.4.6 and 2.3) suggest that attributions and just world beliefs interact with adjustment, it could also be hypothesised that these changes in belief would interact with attributions at different times in the pain experience, in the following way. Specifically, as has been suggested, positive attributions should be more adaptive than negative attributions, and stronger just world beliefs should be more adaptive than weaker just world beliefs. In order to examine this change longitudinally, a large clinical sample of pain sufferers with potentially long-term conditions such as arthritis would be required to be recruited at the onset of their pain. A clinical sample would be required in order to limit the number of variables that might influence changes in these beliefs over time, such as various community treatments. In terms of measurement, just world beliefs, pain intensity, and adjustment could be measured in the way described in the first study, for the reasons given. In terms of attributions, because responsibility and blame were largely indistinguishable from each other (Chapter 5, section 5.3.1.4), only blame attributions would be considered, because most participants discussed their situation in terms of blame, rather than responsibility. Causal attributions would also be examined, because they were the most frequent type of attribution made, and were viewed as separate attributions to responsibility and blame. These concepts would be measured as interview questions. Causal attributions would be measured in a general way, through examining any factors that were perceived to have caused pain (at the start), and cause pain (at each longitudinal timepoint). Blame would be examined in the same way for each time, but not in a general way. Instead, because most participants either made attributions, to themselves, other people, or no one in the present study, and in the literature (see Chapter 2, section 2.2.3.7), they would be asked about these attributions specifically at each time. In terms of longitudinal time period, the available literature typically examines attributions at the onset of a condition, one year later, and then around seven years later (Chapter 2, section 2.3.2.3). Given that just world beliefs were found to differ between the first couple of years of pain, then between a three to nine year period, and after nine years, it makes sense to measure changes in beliefs at a more regular time interval, specifically: at pain onset, then one year later (after a treatment programme), around two years after that (when just world beliefs were found to differ in the present sample), and then again around six years after that (at nine years' pain duration when, again, just world beliefs were found to differ) to establish regular changes in these beliefs. All just world, pain, attribution and adjustment measures would be completed at each time. The importance of such a study are threefold. Firstly, it would determine whether attributions and just world beliefs change over the pain experience, and in using a clinical sample would help determine factors involved in this change, for example specific pain treatments. Secondly, it would help to establish whether strong just world beliefs were consistently adaptive for adjustment to pain over time, and thirdly, it would help to determine which attributions were beneficial for adjustment to pain at different times in the pain experience. The clinical advantages of knowing which beliefs are adaptive for adjustment to pain, and at which times in the pain experience, are that in treatment people could be taught to change maladaptive beliefs at a specific time, to more, identified adaptive beliefs, both about their pain, and about the world.

3. A third future study involves treatment choices in pain. The present study results found attributions made for pain, and treatment for pain to be linked in two ways. Firstly, various attributions were made to a range of medical professionals for either negligence in treatment, or a failure to treat pain (Chapter 5, section 5.2.6). Secondly, attributions were found to be associated with pain treatments, including complementary treatment, which interacted with attributions involving medical treatments (Chapter 5, section 5.3.3). These results suggest that people who make attributions to medical professionals or medical treatment for their pain might be more likely to seek alternative forms of pain treatment than people who do not make these attributions. From this it could be hypothesised that the attributions made for pain influence treatment choices. In order to test this hypothesis, a large community sample of pain sufferers would be required to form the study sample. Although the present study highlighted problems associated with the use of a community sample, this would be required in order to account for varied treatment choice in pain. People suffering from a similar pain condition, such as chronic low back pain, or arthritis would be recruited, in order to account for the fact that different pain treatments might be used because of varied conditions experienced. These participants would be recruited from various treatment centres, including General Practices, and alternative treatment centres, to determine whether people who held specific beliefs about their pain were more likely to seek specific pain

treatments. In terms of measurement, cause and blame attributions would be measured in the way outlined in study two, for the reasons given. The aim of examining both types of attribution would be to determine a range of attributions, both to various factors, and various people that might account for treatment choices. Additionally, treatment history would be examined in order to determine whether previous treatments interacted with current attributions, and perhaps influenced current treatment choices. Pain intensity should also be measured, because, as with treatment history, this might influence treatment choices. Support for this idea comes from the present study finding that people with the strongest pain intensity most often followed the advice of medical professionals in their pain treatment, while people with not so strong a pain intensity were more likely to use complementary treatment for their pain (Chapter 5, section 5.3.6.6). This would be measured in the same way as outlined in the previous studies outlined, for the reasons given. The importance of this study is that it would identify people with misplaced beliefs about their pain, leading them to seek inappropriate treatments, wasting not only their own time, but also the time of various centres who provide the treatment. Those who perhaps have misplaced beliefs could be targeted to be educated about the physical cause of their pain, so that with information they could select appropriate treatment.

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APPENDICES

Appendix 1:

Study Poster Advertisement

Acute/Chronic Pain Sufferers Wanted…

TO PARTICIPATE IN A STUDY EXAMINING YOUR THOUGHTS ABOUT PAIN.

PARTICIPATION WOULD REQUIRE FILLING OUT TWO BRIEF QUESTIONNAIRES AND PARTICIPATING IN A SHORT INTERVIEW (30-45 MINUTES IN TOTAL).

THIS RESEARCH IS BEING UNDERTAKEN AS PART OF A PHD. IF INTERESTED IN PARTICIPATING IN THE STUDY, OR IF YOU WOULD LIKE TO FIND OUT MORE ABOUT THE STUDY, PLEASE CONTACT:

JOANNA MCPARLAND
DEPARTMENT OF NURSING AND MIDWIFERY
UNIVERSITY OF STIRLING, STIRLING,
FK9 4LA
TEL: 01786 466287

Thank You!

Appendix 2.1:

Short-Form McGill Pain Questionnaire

SHORT-FORM MCGILL PAIN QUESTIONNAIRE

PARTICIPANT'S NAME: ________________ DATE__________

	NONE	MILD	MODERATE	SEVERE
THROBBING	0) _____	1) _____	2) _______	3) ______
SHOOTING	0) _____	1) _____	2) _______	3) ______
STABBING	0) _____	1) _____	2) _______	3) ______
SHARP	0) _____	1) _____	2) _______	3) ______
CRAMPING	0) _____	1) _____	2) _______	3) ______
GNAWING	0) _____	1) _____	2) _______	3) ______
HOT-BURNING	0) _____	1) _____	2) _______	3) ______
ACHING	0) _____	1) _____	2) _______	3) ______
HEAVY	0) _____	1) _____	2) _______	3) ______
TENDER	0) _____	1) _____	2) _______	3) ______
SPLITTING	0) _____	1) _____	2) _______	3) ______
TIRING-EXHAUSTING	0) _____	1) _____	2) _______	3) ______
SICKENING	0) _____	1) _____	2) _______	3) ______
FEARFUL	0) _____	1) _____	2) _______	3) ______
PUNISHING-CRUEL	0) _____	1) _____	2) _______	3) ______

NO PAIN 1____________________________________1 WORST POSSIBLE PAIN

PPI

0 NO PAIN ______________

1 MILD ______________

2 DISCOMFORTING ______________

3 DISTRESSING ______________

4 HORRIBLE ______________

5 EXCRUCIATING ______________

Appendix 2.2:

Just World Scale

SOCIAL OPINION SURVEY

1 I've found that a person rarely deserves the reputation he has.
6----5----4----3----2----1
Strongly Agree. — Strongly Disagree

2 Basically, the world is a just place.
6----5----4----3----2---1
Strongly Agree — Strongly Disagree

3 People who get "lucky breaks" have usually earned their good fortune.
6----5----4----3----2----1
Strongly Agree — Strongly Disagree

4 Careful drivers are just as likely to get hurt in traffic accidents as careless ones.
6----5----4----3----2----1
Strongly Agree — Strongly Disagree

5 It is a common occurrence for a guilty person to get off free in British courts.
6----5----4----3----2----1
Strongly Agree — Strongly Disagree

6 Students almost always deserve the grades they receive in school
6----5----4----3----2----1
Strongly Agree — Strongly Disagree

7 Men who keep in shape have little chance of suffering a heart attack.
6----5----4----3----2----1
Strongly Agree — Strongly Disagree

8 The political candidate who sticks up for his principles rarely gets elected.
6----5----4----3----2----1
Strongly Agree — Strongly Disagree

9 It is rare for an innocent man to be wrongly sent to jail.
6----5----4-----3----2----1
Strongly Agree — Strongly Disagree

10 In professional sports, many fouls and infractions never get called by the referee.
6----5----4-----3----2----1
Strongly Agree — Strongly Disagree

11 By and large, people get what they deserve.
6----5----4----3----2----1
Strongly Agree — Strongly Disagree

12 When parents punish their children, it is almost always for good reasons.

6----5----4----3----2----1
Strongly Agree — Strongly Disagree

13 Good deeds often go unnoticed and unrewarded.

6----5----4----3----2----1
Strongly Agree — Strongly Disagree

14 Although evil men may hold political power for a while, in the general course of history good wins out.

6----5----4----3----2----1
Strongly Agree — Strongly Disagree

15 In almost any business or profession, people who do their job well rise to the top.

6----5----4----3----2----1
Strongly Agree — Strongly Disagree

16 British parents tend to overlook the things most to be admired in their children

6----5----4----3----2----1
Strongly Agree — Strongly Disagree

17 It is often impossible for a person to receive a fair trial in Britain.

6----5----4----3----2----1
Strongly Agree — Strongly Disagree

18 People who meet with misfortune have often brought it on themselves.

6----5----4----3----2----1
Strongly Agree — Strongly Disagree

19 Crime doesn't pay.

6----5----4----3----2----1
Strongly Agree — Strongly Disagree

20 Many people suffer through absolutely no fault of their own.

6----5----4----3----2----1
Strongly Agree — Strongly Disagree

Appendix 3.1:

Pilot Interview Schedule

SUBJECT DETAILS

NAME:

AGE:

SEX:

MARITAL STATUS:

NUMBER OF CHILDREN:

PREVIOUS EMPLOYMENT:

PRESENT EMPLOYMENT:

RESIDENTIAL CHARACTERISTICS:

RELIGION:

ESTABLISH WHICH PAIN IS TO BE DISCUSSED: START OFF WITH A BRIEF DISCUSSION

1 How long have you had your pain?
2 How did your pain start in the first place?
(May need to prompt to get back to the root of the pain)

FACTORS INFLUENCING THE MAKING OF RESPONSIBILITY AND BLAME ATTRIBUTIONS

3 Do you think the level of your pain is to be expected, considering how it started in the first place?
4 When your pain first began, were you doing something that you would normally do at that time? (If not, what were you doing? (How do you feel about this?).
5 Were you in a place that you would normally be in at that time? (If not, where were you?).
6 Do you believe that the fact you have pain is "just one of those things", or do you think it is unfair? (If unfair, how do you feel about this?).
7 In general, do you think the onset of your pain could have been avoided? (How do you feel about this?).

ATTRIBUTIONS (Tell them that they don't have to have e.g. cause, responsibility, blame and reason attributions if they really hadn't considered it).

Cause(s) of the pain

ESTABLISH IF THEY HAD EVER THOUGHT ABOUT A CAUSE FOR THEIR PAIN FIRST. TELL THEM ABOUT THE DEFINITIONS.

A cause can be defined as something which brings about a change e.g. a branch falling from a tree and hitting a person on the head. The falling of the branch is the cause, and the resulting headache is the change. This is an example of an impersonal cause, since no one was involved. A personal cause would be where e.g. someone threw a branch and it hit someone on the head. Whether it was intentional or not, the person is still the cause of the headache.

8 What, if anything, do you yourself believe caused your pain to begin in the first place? (Why do you think this? Is there more than one cause? Did anyone cause the pain to happen? If so, why do you think this? Do you believe their actions were intentional? Do you believe they intended the outcome to happen? How do you feel about this?).
9 What, if anything, do you believe causes your pain now? (Is anyone the cause of this? Do you believe they acted intentionally? Do you believe they intended the outcome to happen? How do you feel about this?).
10 What factors triggered your pain at the start? (Not caused) (i.e. What factors brought on a pain episode?).
11 What factors trigger your pain now?

Responsibility for the pain

ESTABLISH IF THEY HAD EVER CONSIDERED ANYONE RESPONSIBLE FOR THEIR PAIN BEFORE THE QUESTION

To be held responsible for something involves being held accountable for something, although not necessarily to blame. In the branch example, the person would be held directly responsible because he/she actually threw the branch, but may not be to blame, because the injured person may have stepped into the path of the branch, which was supposed to hit a tin can on a wall. A person would be indirectly responsible, if he/she didn't actually throw the branch, but e.g. was the parent of a child who threw the branch, and was responsible for the child.

12 Do you yourself believe that you or anyone else was directly or indirectly responsible for the onset of your pain in the first place? (If so, who? Why do you believe this? How do you feel about this?).
13 Do you believe that this person/these people foresaw the consequences, or could have foreseen the consequences of their actions which led to your pain?
14 Do you believe that he/she/they acted intentionally? (Do you believe they intended the outcome to happen?).
15 Do you think that the behaviour that he/she/they carried out, which led to the onset of your pain was acceptable, considering the situation at the time? (Justification).
16 Do you believe that you or anyone else is directly or indirectly responsible for you still having your pain now? (Is it the same person/people? If not, who is it? How do you feel about this?).
17 (If different) Why do you believe this person/these people are responsible for your pain now?
18 Do you believe that he/she/they acted intentionally? (Do you believe they intended the outcome to happen? (i.e. for you to still be in pain). (How do you feel about this? Do you believe that they were able to foresee the consequences of their behaviour, which led to you still being in pain? Do you believe that their actions were acceptable?)

Blame for the pain

ESTABLISH IF THEY HAD EVER BLAMED SOMEONE FOR THEIR PAIN, BEFORE THE QUESTION

To blame someone for something involves finding fault with someone for the occurrence of a negative event. In the branch example, the person throwing the branch would be perceived to be directly to blame for the resulting injury, if e.g. he/she intentionally threw the branch at the other person, with the aim of hitting the other person. A person would be perceived as being indirectly to blame if e.g. he/she encouraged someone to throw the branch at the other person.

19 Do you yourself believe that you or anyone else was directly or indirectly to blame for the onset of your pain in the first place? (If so, who? Why do you think this? How do you feel about this?).
20 What is it about the person that you blame, e.g. their character (i.e. them as a person) or their behaviour?

21 Do you believe that you or anyone else is directly or indirectly to blame for you still having your pain now? (If so, who? How do you feel about this?).
22 What is it about the person that you blame, e.g. their character (i.e. them as a person), or their behaviour?

Reasons/Meaning for the Pain

ESTABLISH IF ANY REASON HAD BEEN CONSIDERED BEFORE THE QUESTION

A reason can be defined as a goal or purpose of something. In the branch example, a reason may have been that the person threw the branch with the purpose of hitting the other person in an act of revenge.

23 Do you yourself believe that there is a reason why you have your pain? What is it/are they? (Does your pain have any meaning to you?).

EMOTIONS TOWARDS PAIN (May have to give examples)

24 What, if any emotions did you have towards your pain when it first began?
25 What, if any emotions do you feel towards your pain now?
26 In general, would you say that since the onset of your pain, you have experienced more positive or more negative emotions? (What are they? Are you still experiencing them?).

MANAGEMENT AND CONTROL OF THE PAIN

27 What treatments have you had for your pain, throughout the course of your pain?
28 Do you yourself manage your pain in any way, over and above taking medication? (Do you feel like this gives you control of your pain?).
29 How do others manage your pain now? (e.g. doctors). (How effective do you find this?).
30 Do you believe that your pain can be controlled? (How does this make you feel?).

LIMITATIONS OF PAIN

31 Has your pain limited what you are able to do on a daily basis? (In what way?).
32 Have you had to adapt your life in any way because of your pain?
33 How well do you feel that you have adapted to your pain?

SOCIAL COMPARISON

34 Do you know other people who are experiencing pain similar to your own? (Who?).
35 (If so), how well do you think you manage your pain, in comparison to those who have a similar pain to you?

36 Are you able to put your pain into perspective (by e.g. saying that there are people worse-off than you?).

IMPORTANCE OF THE PAIN

37 Where does your pain feature in your life, in comparison to your other life experiences? (i.e. is it nothing in comparison to something else?)

SOCIAL SUPPORT

38 Have you received any help and/or support since the onset of your pain? If so, from who?
39 How helpful have you found this support?

KNOWLEDGE/UNCERTAINTY ABOUT PAIN

40 In general, do you feel you know a lot about your pain condition?
41 Are you satisfied with the information you have about your condition?
42 At present, are you uncertain about anything relating to your pain?

EXPECTATION OF PAIN DURATION

43 How long do you expect to experience your pain? (How do you feel about this?).

44 Would you like to tell me anything else about your pain?

Appendix 3.2:

Pilot Study Results

Questionnaire Data

Table 3.1: Descriptive statistics of the questionnaire data

Scale	Mean	Standard Deviation	Range
*Just World	68.5	8.82	56-80
**SF-MPQ			
Overall PPI	8.83	7.2	0-25
PPI Scale Score	3.3	2.8	0-8
Overall UPI	15.8	8.5	4-33
UPI Scale Score	5.0	2.0	1-8
Overall PAW	24.8	8.9	10-41
PAW Scale Score	7.9	1.5	5-10

*Maximum just world score = 120; Data missing from four participants
**Maximum overall present, usual and worst pain intensity scores = 45; Maximum pain scale scores = 10

Key:
PPI = Present Pain Intensity
UPI = Usual Pain Intensity
PAW = Pain at its Worst

Interview Schedule Data

Reliability of the Data

A 79% level of agreement was obtained on the text assigned to the categories, suggesting the coded data was reliable.

Interview Schedule Results

The pilot results are arranged according to their corresponding questions and topics in Chapter 4. Question numbers of the interview are bracketed along with the table of frequencies of responses corresponding to the question. N refers to the number of participants who gave a response, *N refers to participants giving multiple responses i.e. more than one type of response to a question, while % refers to the percentage of the sample who gave a response. *** indicates subcategory definitions.

Topic A: Demographic Information

Table 3.2.1: Sample Demographics (N = 12)

Measure		
Gender	Male = 5 (42%)	Female = 7 (58%)
Marital status	Married = 4 (33%)	Single = 5 (42%)
	Widowed = 2 (17%)	Divorced = 1 (5%)
Number of Children	None = 6 (50%)	Has children = 6 (50%)
Present employment	Employed = 1 (8%)	Student = 6 (50%)
	Retired = 3 (25%)	None = 2 (17%)
Religion	Religious = 2 (17%)	Not religious = 10 (83%)
*Type of Pain	Arthritic = 2	Back = 2
	***Upper body = 3	***Middle body = 4
	***Lower body = 2	
	Mean **(SD)	Range
Age	41.8 (19.97) years	19-81 years
Duration of pain	7.75 (7.22) years	6 weeks -21 years

*Exceeded 12 participants due to one participant reporting more than one type of pain

**Standard deviation

***Upper body = head, neck, shoulder pain; Middle body = stomach, hip pain; Lower body = knee, ankle, foot pain

Topic B: Factors Influencing the Making of Responsibility and Blame Attributions

(3) Table 3.2.2: Category: Level of Pain to Be Expected

Subcategory	N	Total % of sample
Pain To Be Expected	8	66.7
Pain Not to Be Expected	2	16.7
Unsure	1	08.3
Missing data	1	08.3
Total	12	100

(4) Table 3.2.3: Category: Activity at Pain Onset

Subcategory	N	Total % of sample
Activity Normal	9	75
Activity Not Normal	3	25
Total	12	100

(5) Table 3.2.4: Category: Location At Pain Onset

Subcategories	N	Total % of sample
Normal Place	9	75
Not Normal Place	3	25
Total	12	100

(7) Table 3.2.5: Category: Avoidance of the Pain

Subcategory	N	Total % of sample
Pain Could Have Been Avoided	5	41.7
Pain Could Not Have Been Avoided	4	33.3
Do Not Know	3	25.0
Total	12	100

Topic C: Justice Beliefs

(6) Table 3.2.6: Category: Fairness of The Pain

Subcategory	*N
Just "One of Those Things"	9
Unfair	2
Accepting the Pain	2
Deserved the Pain	1

*Multiple responses

(34 & 35) Table 3.2.7: Category: Social Comparison with Similar Others

Subcategory	N	Total % of sample
Knowledge of Others With Similar Pain		
Do Not Know Others	6	50
Know Others	6	50
Total	12	100
Management of Pain in Comparison to Others (N =6)		
Manage Well	2	
Do Not Know	2	
Share Experiences With Each Other	1	
Make an effort with the pain	1	

(36) Table 3.2.8:.Category: Perspective on Pain

Subcategory	N	Total % of sample
Able to Put a Perspective on Pain	11	91.2
Do Not Know	1	08.3
Total	12	100

(37) Table 3.2.9: Category: Pain Feature in Comparison to Life Experiences

Subcategory	N	Total % of Sample
Pain Very Limiting	3	25.0
Pain Dominating Life	2	16.7
Pain Not Dominating Life	4	33.3
Do Not Know	2	16.7
Missing data	1	8.3
Total	12	100

Topic D: Attributions

Table 3.2.10: Category: Previous Consideration of Cause of Pain Onset

Subcategory	*N
Had Previously Considered Cause	
***Physical External Factors	3
Psychological Factors	3
***Physical Internal Factors	2
Had Wondered About Cause	2
Had Not Previously Considered Cause	3

*Multiple responses

***Physical external factors = environmental factors; Physical internal factors = factors within the self e.g. disease, heredity

Table 3.2.11: Category: Previous Consideration of Responsibility for Pain Onset

Subcategory	N	Total % of sample
Had Previously Considered Responsibility:		
Assigned to the Self	3	25
Had not Previously Considered Responsibility	9	75
Total	12	100

Table 3.2.12: Category: Previous Consideration of Blame for Pain Onset

Subcategory	N	Total % of sample
Had Previously Considered Blame:		
Assigned to Physical External Factors	1	08.3
To Others	1	08.3
Had not Previously Considered Blame	10	83.3
Total	12	100

Table 3.2.13: Category: Previous Consideration of Reason for Pain

Subcategory	N	Total % of sample
Had Previously Considered Reason	3	25.0
Not Committed to Response	2	16.7
Had not Previously Considered Reason	7	58.3
Total	12	100

(8 & 9) Table 3.2.14: Category: Causal Attributions for the Pain Onset and Now

Subcategory	Cause of pain onset N	%	Cause of pain now *N
Physical Factors (External)	8	66.7	2
Physical Factors (Internal)	1	8.3	3
***Psychological Factors	1	8.3	2
Do not Know	1	8.3	5
Just There	0	0.0	1
Missing data	1	8.3	
Total	12	100	

*Multiple responses

***Psychological factors include e.g. stress

(10) Table 3.2.15: Category: Pain Triggers at Onset

Subcategory	N	Total % of Sample
Physical Trigger (Internal)	5	42.0
Physical Trigger (External)	4	33.3
Pain Is "Just there"	1	08.3
Unsure of Triggers	1	08.3
Missing Data	1	08.3
Total	12	100

(11) Table 3.2.16: Category: Triggers of Pain Now

Subcategory	N	Total % of sample
Physical Trigger (External)	8	66.7
Physical Trigger (Internal)	2	16.7
Do Not Know	1	08.3
Missing Data	1	08.3
Total	12	100

(12-22) Table 3.2.17: Category: Responsibility and Blame Attributions for Pain Onset and Now

	Onset N (%)		Now N (%)	
Subcategory	Responsibility	Blame	Responsibility	Blame
Self	5 (41.7)	2 (16.7)	6 (50.0)	2 (16.7)
Other People	1 (8.3)	1 (8.3)	1 (8.3)	2 (16.7)
None	6 (50.0)	9 (75.0)	5 (41.7)	8 (66.7)

(23) Table 3.2.18: Category: Reason for the Pain

Subcategory	N	Total % of sample
Physical Reason (Internal)	4	33.3
Do Not Know	2	16.7
Reason Not Assigned	6	50.0
Total	12	100

Topic E: Adjustment

(24-26) Table 3.2.19: Category: Psychological Adjustment for Different Times in the Pain Experience

Subcategory	Emotion (onset) N (%)	Emotion (now) *N	Emotion (since) N
Negative emotions	8 (66.7)	8	9 (75.0)
***Positive statement	1 (8.3)	6	2 (16.7)
Do not know	3 (25.0)	/	/
No Emotions Specified	/	/	1 (8.3)
Total	12 (100)		12 (100)

*Multiple responses

***Positive statements = Positive responses not actually emotions, e.g. reporting an acceptance of the pain

(27 & 29) Table 3.2.20: Category: Medical Treatment of the Pain

Subcategory	*N
Oral Medications	9
Physiotherapy	6
Surgery	4
***External Items of Support	4
Injections	2

*Multiple responses

***External items of support = Items people use to support their pain e.g. wheelchair

(28) Table 3.2.21: Category: Self-Management of the Pain

Subcategory	*N
***Physical Management	6
Do What is Required by Health Professionals	4
***Psychological Management	1
Do Not Do Anything	3

*Multiple responses

***Physical Management = e.g. exercise; Psychological Management = e.g. distraction

(30) Table 3.2.22: Category: Belief In Control of Pain

Subcategory	N	Total % of sample
Believe the Pain Can be Controlled	6	50
Believe the Pain Cannot be Controlled	3	25
Missing Data	3	25
Total	12	100

(31 & 32) Table 3.2.23: Category: Limitations/Adaptations of the Pain

Subcategory	*N
Limitation in Exercise/Hobbies	8
Limitation in Daily Chores	6

*Multiple responses

(33) Table 3.2.24: Category: Feelings of Adaptation to Pain

Subcategory	N	Total % of sample
Adapted Well	6	50.0
Just Living with the Pain	3	25.0
Adapted Satisfactorily	2	16.7
Not Adapted Well	1	08.3
Total	12	100

(38) Table 3.2.25: Category: Support Received Since Pain Onset

Subcategory	*N
Health Professional Support	7
Support from Family and Friends	5
Financial Support	1
Self Help Group Support	1
No Support Received	1

*Multiple responses

(39) Table 3.2.26: Category: Helpfulness of the Support

Subcategory	N	Total % of sample
Very Good	7	58.3
Satisfactory	4	33.3
Little Support	1	08.3
Total	12	100

Topic F: Factors Influencing the Making of Causal Attributions

(40): Table 3.2.27: Category: Knowledge About Pain Condition

Subcategory	N	Total % of sample
Have a lot of Knowledge	4	33.3
Have a Little Knowledge	3	25.0
Have No Knowledge	4	33.3
Trying to Increase Knowledge	1	8.3
Total	12	

(41) Table 3.2.28: Category: Level of Satisfaction With Information

Subcategory	N	Total % of sample
Satisfied With Information	7	58.3
Could Find Out More	2	16.7
Not Satisfied with Information	1	08.3
Unsure	1	08.3
Missing data	1	08.3
Total	12	100

(42) Table 3.2.29: Category: Uncertainties Related to Pain

Subcategory	N	Total % of sample
Uncertainties Related to Pain Duration	5	42
***Physical Uncertainties	3	25
Uncertainties Related to Cause of Pain	1	8.3
Uncertainties Related to Coping	1	8.3
No Uncertainties	2	16.7
Total	12	100

***Physical uncertainties = Uncertainties related to physiological aspects of the pain

Miscellaneous Questions

(43) Table 3.2.30: Category: Expectation of Pain Duration

Subcategory	N	Total % of sample
For Rest of Life	4	33.3
Not Much Longer	3	25.0
Do Not Know	3	25.0
Waiting for Future Incidents	2	16.7
Total	12	100

(44) No participants reported any extra information about their pain

Appendix 3.3:

Post-Pilot Study Interview Schedule Revisions

Improvements and Amendments to the Interview Schedule

Introduction

On the basis of the pilot interview schedule results (see Appendix 3.2), some improvements and amendments were made to the interview schedule. To improve the schedule, some empirically and theoretically derived questions were excluded. Additionally, amendments were made to some existing interview questions, and improvements were made to the interview format.

Questions Excluded from the Interview Schedule

Some of the empirically derived interview questions in the interview schedule were excluded from further investigation in the main phase of the study, for three reasons. Firstly, the responses given to some questions suggested a similarity among the questions asked. Specifically, the responses to questions investigating how the pain started in the first place (question two), triggers of both the pain onset and now (questions 10 and 11), and the question investigating whether the pain has any meaning to the participants (question 23) were similar to the causal attribution responses. This suggests the participants viewed the causal attribution questions in a similar way to these other questions. Subsequently, questions two, 10, 11 and 23 were excluded from the interview schedule (see Appendix 3.1).

Secondly, some questions were not appropriate to ask of mixed samples of pain sufferers. These included questions investigating whether the level of pain was to be expected considering how it started in the first place, whether the pain could have been avoided, and activity and location at the time of the pain onset (questions three, four, five and seven respectively). They were developed from literature in spinal-injured samples as possible factors influencing the nature of the responsibility and blame attributions made. Their exploratory use with the pain sufferers in the present study was irrelevant because not all pain began through traumatic accidents, like spinal-injuries to justify the use of these questions. In anticipation of similar pain samples being obtained in the main phase of the study, these questions were excluded from further exploration (see Appendix 3.1).

Two questions were not relevant because it became clear that responses to previous questions answered them. Question 30, asking about beliefs concerning whether pain could be controlled was excluded because responses to prior questions investigating ways in which the pain was managed answered this, i.e. if pain was being managed then it was being controlled. Additionally, question 39, asking about perceived helpfulness of social support received was excluded because to report receiving social support in the first place implies that this support is in some way helpful (see Appendix 3.1).

The third exclusion of the empirically derived interview questions involved all questions exploring justice beliefs being excluded, because their responses did not reflect justice beliefs. This incorporated questions six, 34,35,36 and 37. Question six asked about whether or not the participants thought it was fair that they suffered pain. This was excluded because the question may have led most of the participants to report their pain to be "One of those things" (see Appendix 3.2 for the pilot study results). Questions 34, 35, 36 and 37 examined ways of maintaining just world beliefs. Questions 34 and 35 asked about whether the participants knew other people with a similar pain to their own. These questions were excluded because most participants reported not knowing others with a similar pain, suggesting they did not use social comparison as a means of maintaining justice beliefs. Question 36 asked if the participants were able to put a perspective on their pain. This was excluded because although most participants reported they were able to put a perspective on their pain (see Appendix 3.2), no one elaborated on this. Question 37 asked where the pain featured in comparison to the participants' life experiences. It was excluded because the responses given were related to limitations of the pain rather than overall justice in relation to one's life experiences (see Appendix 3.1 for the questions). This being the case, the Just World Scale was the only just world belief measure used in the main phase of the study, to investigate general just world beliefs.

Some theoretically derived attribution questions were also excluded from further investigation in the main phase of the study. Questions 13,14,15 and 18, measuring different levels of responsibility were excluded (see Appendix 3.1 for the questions) because they were much too detailed and largely irrelevant to ask of pain sufferers. For example if a participant attributed responsibility for their pain to a doctor, it was not relevant to ask if the doctor intended to harm the person.

Some theoretical questions from the pilot study were explored further in the main study, but were subsequently excluded from analysis. These were questions measuring behavioural and characterological self-blame. In the main study it became obvious from most participants' responses which type of blame they attributed to themselves. For example if someone attributed blame for their pain to their lifestyle, this reflected behavioural self-blame. This led to not everyone being asked to make distinctions between types of self-blame. Additionally, questions examining previous considerations of attributions, and reason attributions were further explored in the main phase of the study, but subsequently excluded from analysis. Previous consideration questions were excluded because some participants reported never having previously considered attributions but when asked about any attributions they had for their pain onset, gave responses straight away. This suggests that the participants already held these attributions, and may have misunderstood the questions investigating previous considerations. To avoid inconsistencies, responses to these questions were excluded from analysis. Questions investigating reason attributions were excluded because their responses resembled causal attributions.

Amendments to Existing Questions

In addition to excluding some questions from the interview schedule, amendments were made to other questions. The results of the pilot study indicated that few responsibility and blame attributions were made (see Appendix 3.2 for the pilot interview results). It was impossible to determine whether the participants would have refrained from attributing responsibility and blame anyway, or if they refrained from making attributions to the self and others, the specification of the questions (see Appendix 3.1) but would have made other attributions. This was explored further in the main study, with no impositions at all being placed on the responsibility and blame attributions that could be made. The causal attribution questions and definitions of all three concepts were similarly altered to convey this.

In terms of adjustment, questions 27 and 29 (enquiring about pain treatments and management) (see Appendix 3.1) were combined to form a question about general treatment, and the question was altered to ask *how many* treatments, rather than *what* treatments the participants had for their pain. The aim of this was to encourage participants to recall as many different types of treatments as possible. Additionally, the similarity of questions 31 (asking about pain limitations), and 32 (asking about adaptations to the pain), led to them being merged in the main study interview schedule. As a result of this, question 33 on feelings about the pain adaptation was omitted. One final alteration involved the social support reported. More participants reported receiving social support from health professionals than family members (see Appendix 3.2 for the pilot interview results). This suggests that in addition to *social support* with pain, the participants' *social lives* should also be investigated to examine the extent to which they interact with others who could provide them with support in the first place. A question asking about social life with the pain was included in the main study interview schedule.

Improvements to the Interview Format

Over and above the various alterations being made to the nature of the interview questions, the order of the questions differed from that outlined in Appendix 3.1 Additionally, subjects were provided with clear instructions on each aspect of the interview schedule.

Summary of Revisions from the Pilot to the Main Study

Table 3.3 summarises the changes in measures made from the pilot to the main study.

Table 3.3: Summary of revisions from pilot to main study

Method	**Pilot Study**	**Main Study**
Measures		
Interview Schedule	*Just world beliefs* (6,34,35,36,37)	
	Cause, responsibility, blame and reason attributions (2,8,9,10,11,12,13,14,15,16,17, 18,19, 20,21,22,23)	*Cause, responsibility, blame and reason attributions* (11,12,13,14, 15,16,17,18,19)
	Factors influencing the making of cause, responsibility and blame attributions (3,4,5,7,40,41,42)	*Factors influencing the making of causal attributions* (20,21,22)
	Psychological, physical and health adjustment outcomes (24,25,26,27, 28,29,30,31,32,33,38,39)	*Psychological, physical and health adjustment outcomes* (2,3,4,5,6,7,8,9, 10)
	Expectation of pain duration and free response question (1,43,44)	*Expectation of pain duration and free response question* (1,23, 24)
Just World Scale	The *belief in a just world* was measured using the Just World Scale	*The belief in a just world* was measured using the Just World Scale
Short-Form McGill Pain Questionnaire	*Pain* was measured using the short-form McGill Pain Questionnaire	*Pain* was measured using the short-form McGill Pain Questionnaire
Sample		
	Adult pain sufferers in the community	Adult pain sufferers in the community
Type of data		
	Interview data and questionnaires	Interview data and questionnaires

( ) in the interview schedule represent the question numbers measuring each concept

Appendix 3.4:

Revised Interview Schedule

<u>BEFORE BEGINNING THE INTERVIEW I WOULD LIKE TO ASK YOU TO BE AS HONEST AS POSSIBLE IN YOUR RESPONSES, GIVING YOUR OWN TRUE RESPONSES. I WOULD ALSO LIKE TO ESTABLISH IF YOU HAVE MORE THAN ONE TYPE OF PAIN, AND IF SO, I'D LIKE TO FOCUS ON THE PAIN WHICH IS YOUR WORST PAIN. IS ANY COURT ACTION BEING TAKEN OVER YOUR PAIN? I'D LIKE TO ASSURE YOU THAT ANY COURT ACTION RELATED TO YOUR PAIN WON'T BE AFFECTED BY YOUR RESPONSES. ANY INFORMATION YOU GIVE ME WILL BE STRICTLY CONFIDENTIAL. PLEASE INDICATE IF AT ANY TIME YOU DON'T UNDERSTAND SOMETHING IN THE INTERVIEW.</u>

DEMOGRAPHIC INFORMATION

NAME:

AGE:

SEX:

MARITAL STATUS:

NUMBER OF CHILDREN:

PREVIOUS EMPLOYMENT:

PRESENT EMPLOYMENT:

HAS YOUR EMPLOYMENT CHANGED SINCE YOUR PAIN ONSET?:

RELIGION:

DURATION OF PAIN

(1) How long have you had your pain?

TREAMENTS FOR PAIN

(2) How many different types of treatment have you had for your pain, throughout the course of the pain?
(3) How effective have you found them?
(4) Do you yourself manage your pain in any way, over and above having the treatments already discussed?

EMOTIONS AND PAIN

(5) What, if any emotions did you have towards your pain when it first began?
(6) What if any emotions do you feel towards your pain now?
(7) In general, would you say that since the onset of your pain you have experienced more positive or more negative emotions?

SOCIAL SUPPORT

(8) How much support from family, friends etc have you received since the onset of your pain?

LIMITATIONS OF PAIN

(9) Have you had to adapt your life in any way because of your pain? If so, in what way?
(10) Has your social life suffered due to your pain? Are you socially active at all?

ATTRIBUTIONS

I WOULD LIKE TO LET YOU KNOW THAT A FEW ATTRIBUTION QUESTIONS MAY BE ASKED MORE THAN ONCE. THE FACT THAT YOU MAY BE ASKED THEM MORE THAN ONCE (IT WILL BECOME CLEAR WHY THIS IS) DOES NOT NECESSARILY MEAN THAT YOU HAVE TO CHANGE YOUR RESPONSES THE SECOND TIME. I AM ONLY LOOKING FOR YOUR TRUE RESPONSES IN EACH INSTANCE. IS THIS CLEAR?

I'd like to begin by asking you about specific beliefs concerning your pain, beginning with causes of your pain. Before I do this, I'd like to ask you if you have ever in the past thought about there being a cause for the onset of your pain, before I'm going to ask you about it now? If yes, what is this?

I will now provide you with a definition of a cause, so that we are both coming from the same angle in understanding what a cause is.

Cause(s) of the pain

A cause can be defined as something which brings about a change e.g. a branch falling from a tree and hitting a person on the head. The falling of the branch is the cause, and the resulting headache is the change. This is an example of an impersonal cause, since no person was involved. It was something which caused the pain. A personal cause would be where, e.g. someone threw a branch and it hit someone on the head. Whether it was intentional or not, the person is still the cause of the headache.

(11) Who or what, if anything, do you yourself believe caused your pain to begin in the first place? (Be aware that it isn't triggers which are being given).
(If a person is involved, ask if they believe the actions of the person were intentional).
(12) Who or what, if anything, do you believe is the cause of you still having your pain now? (Be aware that it isn't triggers which are being given).
(If a person is involved, ask if they believe the actions of the person were intentional).

Responsibility for the pain

I'd like now to ask you about responsibility for your pain, and before I do this I'd like to ask you if you have ever in the past thought about anyone or anything being responsible for the onset of your pain in the first place? If yes, what is this?

I will now provide you with a definition of responsibility, so that we are both coming from the same angle in understanding what the term responsibility means.

To be held responsible for something involves being held accountable for something, although not necessarily to blame. In the branch example, a person would be held directly responsible because he/she actually threw the branch, but may not be to blame, because the injured person may have stepped into the path of the branch, which was supposed to hit a tin can on a wall. A person would be indirectly responsible, if he/she didn't actually throw the branch, but e.g was the parent of a child who threw the branch, and was responsible for the child. In addition to this, it may not have been a person who was responsible for the accident; it may just have been that the branch fell from the tree of its own account, and so the branch is responsible.

(13) Do you yourself believe that anyone, including yourself, or anything, was responsible for the onset of your pain in the first place?
(If another person was involved, ask them if they think it was intentional).
(14) Do you believe that anyone, including yourself, or anything is responsible for you still having your pain now?
(If another person was involved, ask them if they think it was intentional).

Blame for the Pain

I'd like now to ask you about blame for your pain and before I do this I'd like to ask have you ever in the past thought about anyone or anything being to blame for the onset of your pain in the first place? If yes, what is this?

I'd like now to provide you with a definition of blame, so that we are both coming from the same angle in understanding what blame means.

To blame someone for something involves finding fault with someone for the occurrence of a negative event. In the branch example, a person throwing the branch would be perceived to be directly to blame for the resulting injury, if e.g. he/she intentionally threw the branch at the other person, with the aim of hitting the other person. A person would be perceived as being indirectly to blame if e.g. he/she encouraged someone to throw the branch at the other person. Blame can also be attributed not only to people, but to something, e.g. the branch.

(15) Do you yourself believe that anyone, including yourself, or anything was to blame for the onset of your pain in the first place?
(If attributions made to the self):
(16) What is it about yourself that you blame, e.g. your character (i.e. you as a person) or your behaviour?
(17) Do you believe that anyone, including yourself, or anything is to blame for you still having your pain now?
(If attributions made to the self):
(18) What is it about yourself that you blame, e.g. your character (i.e. you as a person) or your behaviour?

Reasons for the pain

I'd like now to ask you about a reason for your pain, and before I do this I'd like to know if you have ever in the past thought about there being a reason why you have your pain, before I ask you about it. If yes, what is this?

A reason can be defined as a goal or purpose of something. In the branch example, a reason may have been that the person threw the branch with the purpose of hitting the other person in an act of revenge.

(19) Do you yourself believe that there is a reason why you have your pain?

KNOWLEDGE/UNCERTAINTY ABOUT PAIN

(20) In general, do you feel you know a lot about your pain condition?
(21) Are you satisfied with the information you have about your condition?
(22) At present, are you uncertain about anything relating to your pain?

MISCELLANEOUS

(23) How long do you expect to experience your pain? How do you feel about this?
(24) Would you like to tell me anything else about your pain?

Appendix 4.1:

Participant Information Sheet

PARTICIPANT INFORMATION SHEET

The aim of this study is to examine how your thoughts about your pain affect how you experience your pain. This will be done using an interview, which contains questions related to various factors which may influence your experience of pain. The questions themselves will allow you to tell me as much as you can about your pain. In order to obtain as much information as possible, the interview will be tape-recorded, and only I will be able to identify who you are. You will be allocated a number, to ensure the confidentiality of your information. The interview tapes will be carefully stored in a locked filing cabinet, and only I will be able to access them. As well as the interview, your pain will be measured using a simple Pain Questionnaire; and you will complete a short Social Opinion Scale. The whole process should take between 30 minutes-45 minutes.

This is not a therapeutic session. You will receive no benefits from participating in the study, and any compensation claims won't be affected by your participation. You have the right to refuse to answer any questions, and you will be able to leave the interview session at any time. Only I will benefit from your participation in this research, for my PhD.

For further information, please contact me on: 01786 466287. I can also be reached at the following address:

Joanna Mc Parland
Department of Nursing and Midwifery
University of Stirling
Stirling
FK9 4LA

Thank you for your co-operation in this study.

Appendix 4.2:

Consent Form

CONSENT FORM

For more information, please contact:

Joanna McParland
Department of Nursing and Midwifery
University of Stirling
Stirling
FK9 4LA

Telephone: 01786 466287

I have read the information sheet and fully understand what is being asked of me.

I acknowledge that I will not personally benefit from my participation in the study.

I am aware that I can withdraw from the study at any time, and that I have the right to refuse to answer questions, and request that the interview material be destroyed.

Under these conditions, I am willing to participate in this study.

SIGNED:

Appendix 5:

Main Study Adjustment Results

Chapter 5 (section 5.3.2.2) reported common types of adjustment entered into statistical analyses. Less frequently reported responses can be seen in Table 5.

Table 5: Less Frequent Types of Adjustment

Type of Adjustment	N
Health	
Treatments	
Treatment at a specialised centre* (Pain Clinic/Psychological Treatment/ Pain Management Course)	15
Injections	8
Chiropractor	8
Others (exercise, occupational therapy, bone/nerve treatment, scans, X-rays, TENS machine)	8
Pain Self-Management Techniques	
Do not do anything	9
Unspecified self-management	1
Functioning	
Physical	
Did not have to adapt/unspecified adaptation	5
Social Support	
**Negative reactions/anticipate this from others	7
Support from external agencies	7
Unspecified origin of support	8
Little support received	8

*Some treatments may have been received at a specialised treatment centre but not stated as such

** Although not an actual form of support it is a barrier to receiving support

Appendix 6:

Letter to Examiners

Letter to examiners : response to request for explanation of multivariate statistics.

"The candidate should document exactly where multivariate analyses have been undertaken and exactly what the rationale was, and what the statistical assumptions were".

Three types of multivariate analyses were used in the thesis: factor analysis, analysis of variance (ANOVA) and regression. The specific types of multivariate analyses used will be considered in separate sections in this letter. Within these sections, specific thesis extracts corresponding to the analysis are highlighted in bold font, and the explanation of the analysis follows this.

Where factor analysis was used in the thesis (p202-203)

The fact that associations were found between the categories "Self" and "Others" across cause, responsibility and blame, for both times periods, led to a principal components factor analysis being carried out as a means of identifying similar patterns across the data. Three factors emerged with eigenvalues greater than one, accounting for 69.7% of the total variance. Table 5.5 shows the factor loadings that had been subjected to varimax rotation, along with the communalities.

Table 5.5: Varimax factor analysis of 12 items relating to attribution response (2) x attribution type (3) x both time periods (2) (N = 43, the number of participants who made attributions to the self and/or others)

Variable	**Factor 1**	**Factor 2**	**Factor 3**	**Communality**
Others cause of onset	/	.882	/	.827
The self cause of onset	.581	/	/	.389
Others cause now	/	/	.822	.750
The self cause now	.806	/	/	.669
Others responsible onset	/	.831	/	.770
The self responsible onset	.775	/	/	.621
Others responsible now	/	/	.822	.850
The self responsible now	.843	/	/	.802
Others blame onset	/	.774	/	.750
The self blame onset	.706	/	/	.565
Others blame now	/	/	.669	.743
The self blame now	.717	/	/	.628
Eigenvalue	4.74	2.87	1.01	
% variance	37.3	23.9	8.5	

A cut-off point of 0.5 was used for the inclusion of loadings in the interpretation of the factors (Comrey, 1978). Each variable loaded on only one factor and no variable failed to load on any factor. The first factor, accounting for 37.3% of the variance attracted high positive loadings from the category "Self", across all three attribution types, for both time periods. It was named, "Attributions to the self". Factor 2 accounted for 23.9% of the variance, and attracted loadings from the category "Others" for the pain onset, for all three attribution types. This was

named, "Attributions to others for the pain onset". The third factor accounted for 8.5% of the variance, and attracted high loadings from the category "Others" for the pain now, for all three attribution types, and so was called, "Attributions to others for the pain now". Combined, the items in each factor produced a Cronbach's alpha coefficient score of 0.71. These factor scores were retained for further analysis.

Explanation of analysis

An analysis present in the original thesis, factor analysis was used to identify similar patterns across the attribution data. There are several statistical assumptions that must be met in order for factor analysis to be conducted (Pallant, 2001, p152-157). These include that firstly, there should be a ratio of at least five cases for each of the variables. This assumption was approximately met, given that there were 12 variables and 43 participants. Secondly, to be considered suitable for factor analysis, the correlation matrix should show at least some correlations of $r = 0.3$ or greater. This assumption was met because the variables generally correlated with each other to a value beyond 0.3. Additionally, Bartlett's test of sphericity was statistically significant at $p<0.05$, ($p = 0.00$) and the Kaiser-Meyer-Olkin value was higher than the recommended value of 0.6 (0.75). Pages 148-149 of the thesis also justifies and explains the procedure for using a principal components analysis.

Where ANOVA techniques were used in the thesis

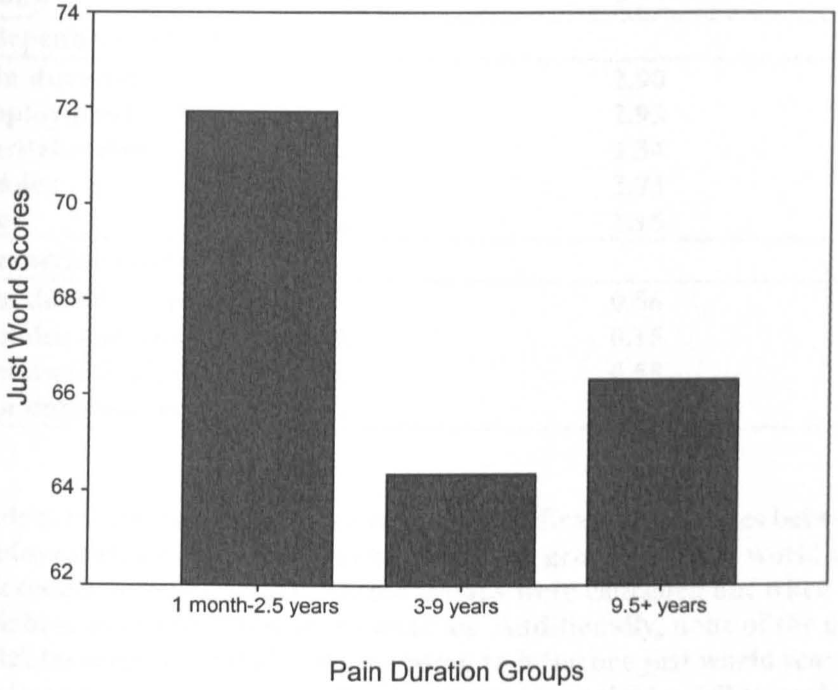
ANOVA was used in a number of thesis sections. There are four key statistical assumptions that must be met when conducting ANOVA (Field, 2002, p257-258). Firstly, data must be collected from a normally distributed population. Secondly, the variances within each condition must be similar. Thirdly, observations should be independent, and fourthly, the dependent variable must be measured on at least an interval scale. These assumptions were met within the following analyses.

Thesis section (p234-235)

Differences in Just World Beliefs Within Pain-Related Variables

ANOVA was used to determine any differences in just world scores between the different type of pain and pain duration groups. No differences were found between the type of pain groups ($F(4,57) = 1.5$, $p = 0.21$), but ANOVA comparing the just world scores of different pain duration groups produced a significant result ($F(2, 59) = 4.26$, $p = 0.01$). This indicated a difference in the strength of just world beliefs between the pain duration groups. There was a large difference in the mean scores between groups. The effect size, calculated using eta squared, was 0.13. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for the 1 month - 2.5 years pain duration group ($M = 71.95$, $SD = 10.27$) was significantly different from the second, 3 - 9 years pain duration group ($M = 64.33$, $SD = 7.70$). The third pain duration group, 9.5+ years ($M = 66.35$, $SD = 9.22$), did not significantly differ from either of the other two pain duration groups. The results indicate that those who had pain for the shortest length of time had stronger beliefs that the world is a just place, than those who had suffered pain for the middle pain duration. The effect seemed to level out after 9 years' pain duration. This can be seen in Figure 5.2.

Figure 5.2: Mean just world scores across pain duration groups



Explanation of analysis

One-way between groups ANOVA were used to determine differences in just world beliefs within type of pain and pain duration groups. Each independent variable group contained two or more categories, and the dependent variable (just world beliefs) was continuous. This supports the requirements for a one-way ANOVA (Pallant, 2001, p188. See also thesis, p153). Within each analysis the statistical assumptions of ANOVA were met in the following way. Firstly, the observations were independent. Secondly, the dependent variable was of interval level. Thirdly, the assumption of normal distribution was met in theta scores on the dependent variable were normally distributed (see page 234 of the thesis for the normal distribution graph; Pallant, 2001, p172), and fourthly, the assumption of equal variances was met, given that the significance value for Levenes test of homogeneity of variance exceeded the stated 0.05 level (Pallant, 2001, p190). Thus, one-way ANOVA were appropriate for the purposes of determining differences in just world belief scores within pain-related groups. Given the difference found among pain duration groups, the recommended post-hoc Tukey HSD test was used to determine where the difference lay (Pallant, 2001, p188-189).

The next part of this analysis began on page 236:

Further ANOVA were conducted to determine any demographic factors that might mediate or moderate this effect of pain duration on just world belief scores. The results of this analysis can be seen in Table 5.18.

Table 5.18: Demographic influences on just world scores

Group	df	F	p
Independent effects			
Pain duration	2	2.90	0.09
Employment status	3	2.93	0.07
Marital status	4	2.34	0.11
Gender	1	2.73	0.12
Age	2	1.15	0.35
Interaction effects			
Pain duration/employment	3	0.56	0.65
Pain duration/marital status	1	0.15	0.31
Pain duration/gender	1	0.55	0.47
Pain duration/age	1	0.47	0.51

Table 5.18 indicates that there were no significant differences between employment, marital status, gender and age groups, on just world scores, and differences between pain duration groups were cancelled out when these other variables were entered into the analysis. Additionally, none of the demographic variables interacted with pain duration to influence just world scores. These results suggest that not only did demographic variables fail to mediate the effect of pain duration on just world scores, but also there were no demographic differences on just world scores.

Explanation of this analysis

This second section of the analysis involved further ANOVA to determine any demographic differences in just world scores, and to determine whether any of these variables interacted with pain duration in its effect on just world beliefs. In order to conduct this analysis, a five-way ANOVA was conducted, with just world beliefs as the dependent variable, and each of the pain duration, employment, marital status, gender and age groups as the independent variables. As with the above analysis, the statistical assumptions of ANOVA were met. The procedure for conducting this analysis is an extension of the two-way ANOVA (see page 153 of the thesis). The results indicated that there were no main effects or interactions effects, suggesting that there were no differences in just world scores within each of the demographic groups, and none of these groups interacted with pain duration in its effect on just world beliefs (Table 5.18).

Thesis section: (p236-237)

The Role of Attributions in Maintaining Just World Beliefs

ANOVA to determine any differences in just world scores between those who made causal attributions for the pain now and those who did not (reporting their pain to be "just there") revealed non-significant main effects for making attributions (F(1,57) = 2.46, p = 0.12), not making them (F(1,57) = 0.92, p = 0.43), and interactions between them (F(1,57) = 0.65, p = 0.43). This suggests both groups did not differ in their just world scores. Additional ANOVA to determine whether those who attributed responsibility or blame to themselves differed in

their just world beliefs from those who made these attributions to others revealed non-significant main effects for attributing responsibility to the self (F(1,57) = 0.003, p = 0.96), others (F(1,57) = 0.72, p = 0.79), or interactions between them (F(1,57) = 0.01, p = 0.93). There were also no main effects for attributing blame to the self (F(1,55) = 0.25, p = 0.62), others (F(1,55) = 0.002, p = 0.97), or interaction effects between them (F(1,55) = 0.31, p = 0.58). These results suggest there were no differences in just world scores between those who made attributions to themselves versus others.

Explanation of analysis

In order to determine whether there were any differences between attribution groups in their just world scores, two-way between-groups ANOVAS were conducted. Three separate ANOVAS were conducted, to examine just world differences between firstly those who make causal attributions for their pain and those who did not; secondly, those who attributed responsibility for their pain to themselves versus others, and thirdly, those who attributed blame for their pain to themselves, versus others. These analyses were in keeping with the literature reviewed in Chapter 2, which stated that making causal attributions were more beneficial in maintaining justice beliefs than not making them, and that making attributions to the self over others helps to maintain justice beliefs. The statistical assumptions of ANOVA were met, in the following way. Firstly, the just world dependent variable was at interval level. Secondly, observations were independent. Thirdly, the assumption of normal distribution was met, and fourthly, Levenes test of equal variances was supported. Additionally, the criteria for a two-way between-groups ANOVA was supported, in that the dependent variable was continuous, and there were two groups containing two subgroups entered into each analysis (see page 153 of the thesis).

Thesis section (p241)

ANOVA revealed significant differences between the pain scores, Wilk's Lambda = 0.21, (F(2,58) = 108.12, p<0.001), multivariate eta squared = 0.79. A post-hoc analysis using the Bonferroni procedure revealed each of the overall present, usual and worst pain intensity scores to be significantly different from each other.

Explanation of analysis

In order to determine whether each of the overall reported present, usual and worst pain intensities differed from each other, a repeated measures ANOVA was conducted. This was an appropriate analysis because all participants completed the same continuous measure, reported for three different time periods (Pallant, 2001, p195-196; See also thesis, p153). The reported differences were tested using the recommended Bonferroni procedure (Field 2002, p329-333).

Thesis section (p242-247)

Individual Differences in Usual Pain Intensity

An exploration of individual differences in usual pain intensity produced both demographic and pain-related differences. These differences and their significant interaction effects are summarised in Table 5.20.

Table 5.20: Individual differences in usual pain intensity

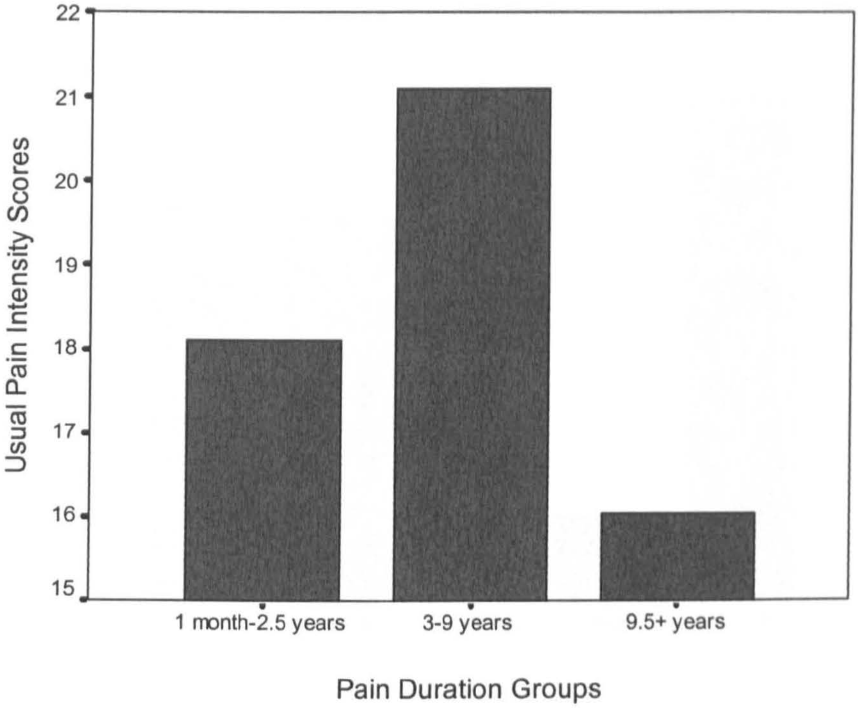
Group	df	F
Independent effects		
Pain Duration	**2**	**14.12*****
Employment	**3**	**0.35**
Marital status	**4**	**8.25*****
Gender	**1**	**5.04***
Age	**2**	**6.49***
Interaction effects		
Pain duration and gender	**1**	**10.38****
Marital status and gender	**2**	**8.28****

*****p<0.005; **p<0.01; *p<0.05**

Four independent effects emerged (Table 5.20). A post-hoc test could not be conducted for gender because there were only two groups, but an analysis of mean scores indicated that males (M = 19.12; SD = 1.25), and females (M = 19.02; SD = 0.85) were similar in their usual pain intensity. In terms of age, a post-hoc comparison using the Tukey HSD test indicated that none of young (M = 19.12; SD = 1.20), middle-aged (M = 20.66; SD = 1.18), and older age groups (M = 17.26; SD = 1.27) differed significantly from each other on their usual pain intensity scores. They all have an effect on usual pain intensity.

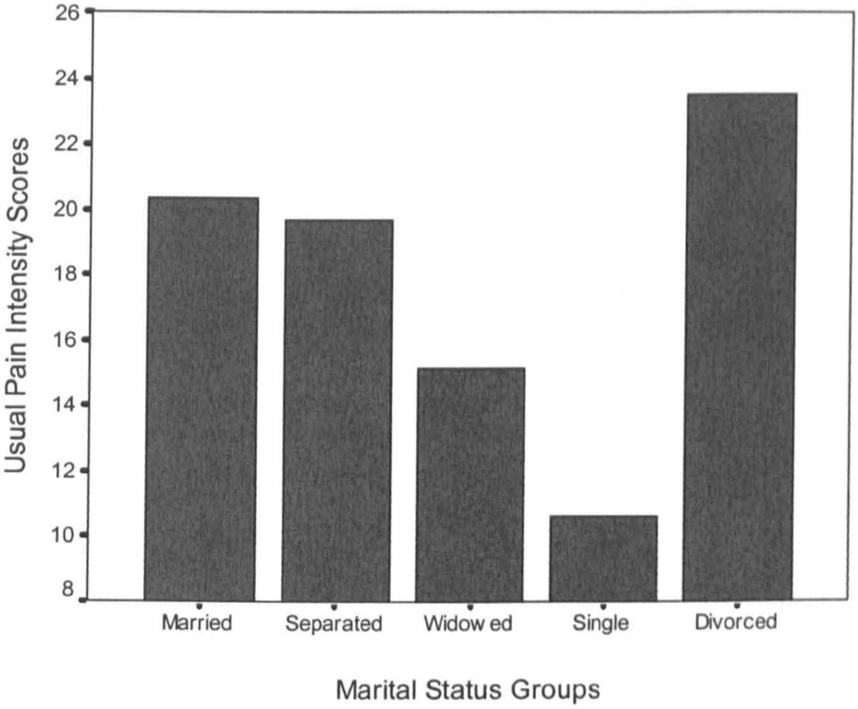
In terms of pain duration groups, a post hoc test indicated that those with pain for between three to nine years' duration had significantly different pain scores from those who had pain for over nine years' duration. An examination of mean scores indicated that those with pain for between three to nine years' duration had higher pain scores (M = 21.67, SD = 1.20) than those with pain for over nine years' duration (M = 15.53, SD = 1.21). This difference can be seen in Figure 5.3.

Figure 5.3: Differences in usual pain intensity between pain duration groups



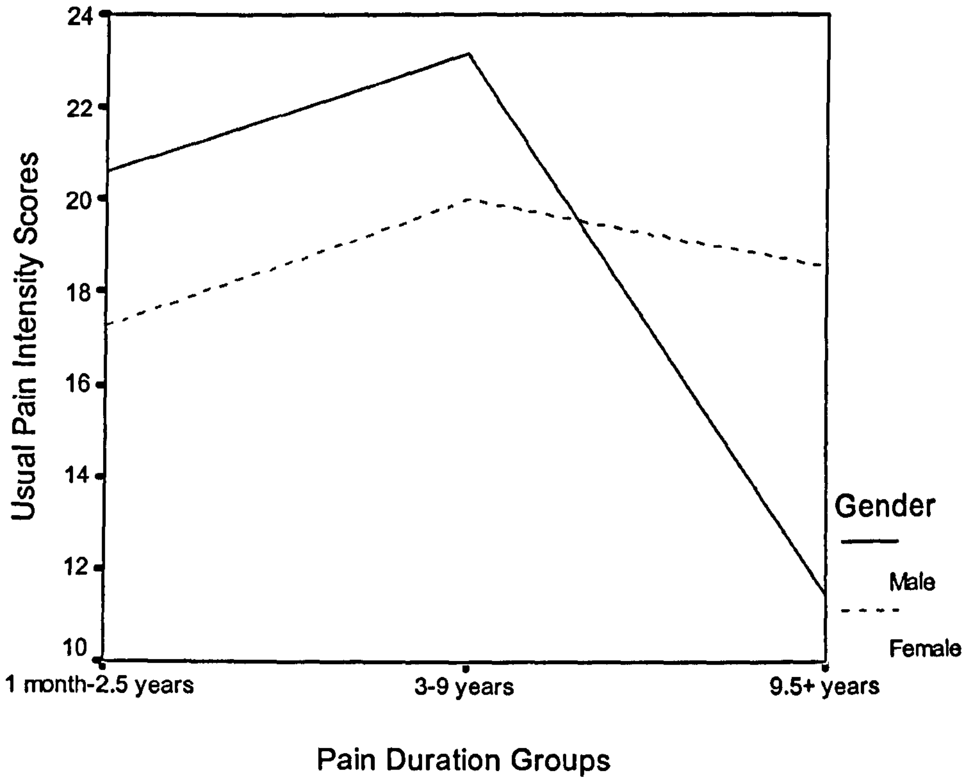
In terms of marital status groups, a post-hoc test indicated that those who were single had significantly different usual pain intensity scores from those who were married, and divorced. An examination of mean scores indicated that those who were single had significantly lower pain scores (<u>M</u> = 11.81, <u>SD</u> = 1.73), than those who were married (<u>M</u> = 20.58, <u>SD</u> = 0.95), and divorced (<u>M</u> = 23.50, <u>SD</u> = 1.82). This difference can be seen in Figure 5.4.

Figure 5.4: Differences in usual pain intensity between marital status groups



An examination of interaction effects indicated that gender mediated the effects of both pain duration and marital status on usual pain intensity scores (Table 5.20). The interaction between pain duration and gender can be seen in Figure 5.5.

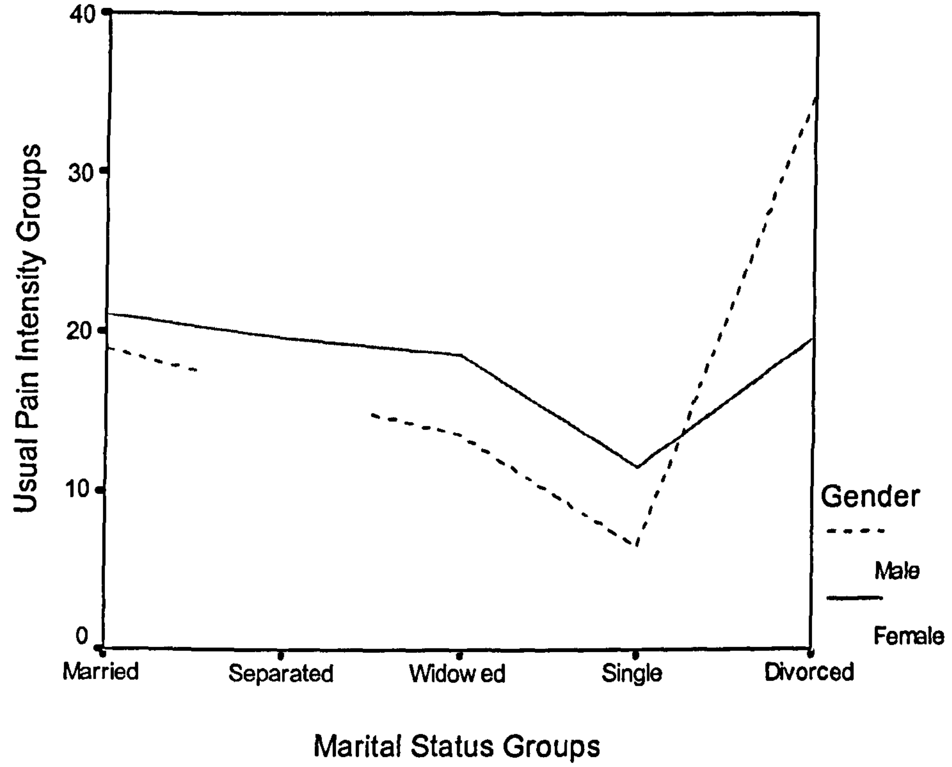
Figure 5.5: Interaction between pain duration and gender on usual pain intensity



The graph indicates that males with pain for between three to nine years' duration had higher pain scores than the males in the other pain duration groups, and the females of the sample. Additionally, females within this pain duration had higher usual pain intensity scores than the females in the other groups. Further exploration of these gender differences using ANOVA suggested that the observed differences in pain intensity between male pain duration groups was non-significant ($\underline{F}(2,16) = 2.31$, $\underline{p} = 0.13$), as were those for the female pain duration groups ($\underline{F}(2,38) = 0.34$, $\underline{p} = 0.71$).

The interaction between marital status and gender can be seen in Figure 5.6.

Figure 5.6: Interaction between marital status and gender on usual pain intensity



The graph indicates that divorced males had higher usual pain intensity scores than married, separated or single males, and the females of the sample. Additionally, widowed females had higher usual pain intensity scores than females in the other marital status groups. Further exploration of these gender differences using ANOVA indicated that the observed difference in usual pain intensity between females marital status groups was non-significant (F(2,36) = 2.21, p = 0.09), but the observed differences between male marital status groups was statistically significant (F(3,15) = 3.34, p = 0.05). Post hoc analyses using the Tukey HSD test indicated that divorced males had significantly higher pain intensity scores (M = 35.00, SD = 12.73), than single males (M = 6.50, SD = 0.71).

Explanation of analysis

A five-way ANOVA was conducted to determine any demographic differences in reported usual pain intensity, with usual pain intensity as the continuous dependent variable, and pain duration, employment, marital status, gender and age as the independent variable groups. Statistical assumptions were met in this analysis in the following way. Firstly, criteria were met for Levene's test of equal variance. Secondly, the dependent variable was of interval level. Thirdly, observations were independent, and fourthly, the assumption of normal distribution was met in that any skew in UPI scores was corrected (see page 240 of thesis). Some significant independent effects emerged, and were examined further using recommended post-hoc tests (Pallant, 2001, p201-208). Two interaction effects also emerged, and were examined further using recommended one-way ANOVAS to examine particular subgroup effects within these results (Pallant, 2001, p207-208). For the interaction between gender and pain duration on usual pain intensity, gender was split into males and females using the procedure recommended by Pallant (2001, p208) to examine the effects of pain duration on usual pain intensity separately, for males and females. This was also conducted for the interaction between marital status and gender on usual pain intensity.

Where regression was used in the thesis

In the following sections of the thesis stepwise multiple regression procedures were used. This method of regression was adopted for two reasons. Firstly, given the exploratory nature of the present study, there is no other available research to recommend the ordering of predictor variables within regression, which would allow hierarchical regression to be carried out, and secondly, there is no theoretical basis for ordering the variables in a particular order. Instead, stepwise regression procedures were used to allow statistical criteria to determine the order in which the variables should be entered and removed from the calculation, based on the amount of variance in the dependent variable predicted by the independent variable (Pallant, 2001, p135-136. See also thesis, p151-152). The key statistical assumptions to be met when conducting multiple regression analyses include that firstly, multicollinearity and singularity must be considered. Multicollinearity refers to high correlations between independent variables ($r = 0.9$ or above), and singularity occurs when one independent variable is actually a combination of other independent variables. The independent variables must be correlated with the dependent variable to a value of at least 0.3 and must not be correlated with each to a value beyond 0.7. Secondly, there must be no outliers in the data. Thirdly, to check for normality, linearity and homoscedacity, the residuals should be normally distributed around the predicted dependent variable scores, should have a linear relationship with the dependent variable scores, and the variance of the residuals around the predicted dependent variable scores should be the same for all predicted scores (Pallant, 2001, p136-137). These assumptions were met in the following analyses.

Thesis section: (P247)
Pain Intensity and Attributions

A stepwise multiple regression was conducted to determine whether any of the independent variable, attribution factors, "Attributions to the Self", "Attributions to others for the pain onset", and "Attributions to others for the pain now" predicted the dependent variable, usual pain intensity. Only the factor "Attributions to others for the pain onset" was significant ($F(1,52) = 8.12$, $p = 0.006$). However, R^2 was only 13.5%, indicating this factor only explained a small amount of the variance of usual pain intensity. As such, it is possible that other factors might be related to the dependent variable. Further analyses indicated that none of the age, gender, pain duration, marital or employment status variables, or just world beliefs mediated the effects of attributions on pain intensity.

Explanation of analysis
A stepwise multiple regression was used to determine whether any of the attribution factors predicted usual pain intensity. In order to carry out the regression, usual pain intensity was the entered as the continuous variable, and three independent factor

scores were entered: "Attributions to the self"; "Attributions to others for the pain onset", and "Attributions to others for the pain now". Age, gender, pain duration, marital and employment status were also included as independent variables. The statistical assumptions of regression were met in that the independent variables did not correlate with each other beyond the value of 0.7, and although only one variable (attributions to others for the pain onset) correlated with the dependent variable to a value beyond 0.3, this assumption was not violated because the stepwise regression procedure would find the best model (statistical advice, Kate Howie 2004). Other statistical assumptions were met in that there were no outlying values, the residual plot indicated that the data was normally distributed, and the assumption of homogeneity of variance was met. The results suggested that only one independent factor, "Attributions to others for the pain onset", predicted a small amount of variance in usual pain intensity.

Thesis section: (p248)
Pain Intensity and Adjustment

Stepwise multiple regression analyses to examine whether any types of adjustment predicted usual pain intensity, indicated that types of treatment predicted pain intensity. These are listed in Table 5.21.

5.21: Treatment predictors of usual pain intensity

Variable	R^2	ΔR^2	β final	t final	p final
Physiotherapy	**0.141**	**0.127**	**-0.389**	**-3.376**	**0.001**
Oral medications	**0.225**	**0.198**	**0.345**	**2.956**	**0.005**
Do what is required by health profession	**0.281**	**0.242**	**0.246**	**2.087**	**0.041**

Stepwise procedures entered physiotherapy first, and this alone predicted 14.1% of the variance in usual pain intensity. When oral medications was entered, together this predicted 22.5% of the variance, and when "Do what is required by health professionals" was entered, all three variables together predicted 28.1% of the variance in usual pain intensity (Table 5.21).

Explanation of analysis
Stepwise multiple regression procedures were used to determine whether any of the adjustment outcomes predicted usual pain intensity. Dr Swanson questioned the use of multiple dichotomous variables within linear regression analyses. However, not all of the adjustment variables were entered into one regression analysis. Instead, three separate regressions were conducted to determine the ability of the health, psychological and functioning outcomes to predict pain intensity. This meant that no more than seven independent predictor variables were entered into the analysis at a time. This is considered a suitable number of independent variables (statistical advice, Kate Howie 2004).The statistical assumptions of regression were met in these analyses, in that although the reported correlations between variables were low, residual plots indicated that the data was approximately normally distributed, and the assumption of homogeneity of variance was met. When the health-related adjustment outcomes were entered into regression together, three of them predicted some of the variance in usual pain intensity. None of the other psychological or functioning outcomes predicted usual pain intensity.

Thesis section: (p237)

Further exploratory analyses using multiple regression techniques to determine the ability of attributions in general to predict just world beliefs were non-significant (not tabulated), suggesting that beyond no differences in just world beliefs being found between attribution groups, attributions did not interact with just world beliefs at all.

Explanation of analysis

Beyond looking for differences in just world scores between attribution groups, as part of the recommended further exploration of the data, stepwise multiple regression analyses was conducted to determine the ability of attributions to predict just world beliefs. In order to conduct this analysis, three separate regressions were conducted in which the just world belief score was entered as the dependent variable, and each of the causal (physical external, internal self and others), responsibility (to self and others) and blame (to self and others) attributions were entered as independent predictor variables within each of the three analyses. Statistical assumptions of regression analyses were met in that although the correlations between variables were generally low, the residual plots showed that the assumptions of normality and homogeneity of variance were valid. Each analysis revealed that none of the attributions predicted any variance in just world scores.

Thesis section: (p239)

Further exploratory analyses using multiple regression techniques to determine the ability of the health, psychological and functioning outcomes to predict just world beliefs were non-significant (not tabulated), suggesting that in the present study adjustment did not interact with just world beliefs at all.

Explanation of analysis

As part of a further exploration of the data, after considering differences in adjustment between the different strength of just world belief groups, three stepwise regression analyses were conducted to determine the ability of each of the independent variable health, psychological and functioning outcomes to predict the dependent variable, just world beliefs. Again, although the correlations between variables were generally low, the residual plots showed that the assumptions of normality and homogeneity of variance were valid. Each analysis revealed that none of the adjustment outcomes predicted any variance in just world scores.

Thesis section(p222)

Differences in Adjustment Between Making/Not Making Causal Attributions

Logistic regression analyses were conducted to determine whether making causal attributions for the pain now predicted more adjustment outcomes than not making causal attributions, to establish any differences between both groups. All analyses between these independent variables and each of the health, psychological and functioning dependent variables (see Table 5.11), were non-significant (not tabulated). This suggests that neither making attributions as a whole, nor refraining from making them, predicted any of the adjustment outcomes, indicating they did not differ in their ability to predict adjustment.

Explanation of analysis

In this section of the thesis a logistic regression analysis was used instead of multiple regression, because both the dependent and independent variables in this analysis were categorical, and several assumptions of multiple regression were not met. In particular, logistic regression does not assume a linear relationship between the dependent and independent variables; the dependent variable does not need to be normally distributed, homogeneity of variance is not assumed; and the dependent variable need not be of interval level. However, there are some assumptions of logistic regression that must be met (http://www2.chass.ncsu.ed/garson/pa765/logistic.htm), including that the data must be coded in a meaningful way. This assumption was met, with the categorical presence of a response being coded as 1 and the absence of the response coded as 0. Additionally, all relevant variables must be included in the model, and irrelevant variables excluded. Given that the ordering of the variables was dictated by the literature, this was achieved. An analysis present in the original thesis, logistic regression was used to determine whether there were any differences in adjustment between those who made causal attributions for their pain, and those who did not. Although testing for differences, logistic regression was the method employed to examine this, because this would determine whether making causal attributions predicted more or fewer adjustment outcomes than not making causal attributions. Although Dr Swanson questioned the skewed nature of the categorical variables, by its nature categorical data are not normally distributed. Additionally, with categorical data equal numbers cannot be expected within each group (statistical advice, Kate Howie 2004). This analysis was conducted in the following way. Separate regression analyses were run for each of the health, psychological and functioning types of adjustment, with each outcome as the dependent variable and making causal attributions and not making them as categorical independent predictors in each analysis. This procedure is in keeping with suggested ways of conducting logistic regression analyses (Field, 2002, p166-167).Within each analysis the default forced entry method was selected to determine any initial predictors of the adjustment outcomes (page 152 of thesis, and statistical advice, Kate Howie 2004). However, in all analyses none of the categorical variables contributed to the predictive power of each of the adjustment outcomes, suggesting that making causal attributions and not making them, did not differ in their ability to predict adjustment.

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