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Self-identity and Chronic Illness:
Is self-illness enmeshment unique to chronic pain?

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Literature Review:

"I don't know who I am anymore"

The impact of chronic pain on self-identity

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"I don't know who I am anymore"

The impact of chronic pain on self-identity

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Abstract

Chronic pain has an impact on an individual's sense of self. Many people report that it affects their sense of who they are and what they want to be, and contributes to perceived loss of roles and a narrowing of behavioural repertoire. This is important clinically since chronic pain is associated with increased levels of depression and hopelessness. The impact of chronic pain on explicit sense of self (i.e. self-reported aspects of identity) has been of interest to researchers and clinicians for some years, but the impact of chronic pain on implicit self-identity (i.e. an underlying sense of self, which may not be accessible by direct questioning) has not been investigated. If chronic pain presents a challenge to the individual's sense of self, it may be hypothesised that the underlying (or implicit) sense of self will also be impacted upon, causing individuals to evaluate themselves more negatively in subtle, and perhaps unconscious, ways. However, the relationship between explicit and implicit levels of self-esteem is not always this straightforward. Studies of the self in relation to psychopathology indicate subtle discrepancies between implicit and explicit self-esteem. The impact of psychopathology on the underlying sense of self is therefore complex. Nonetheless, in the field of chronic pain, where individuals may report feeling a burden or being 'disbelieved', the use of measures of the self which address presentation biases is especially relevant. In this paper, we consider what is known about the impact of chronic pain on an individual's identity, or sense of self. We also identify questions, which remain unanswered, about the effect of chronic illness on an underlying sense of self, and investigate a widely used methodology for measuring implicit self-esteem, the implicit attitude test (IAT), which could be applied to research these questions.

KEYWORDS: chronic pain, self-identity, self-esteem, implicit.

The impact of chronic pain on self-identity.

The challenge of Chronic Pain

Chronic pain, which is defined as pain that persists in the absence of tissue damage, is costly, difficult to treat, and worryingly prevalent. The incidence of chronic pain (particularly chronic low back pain) has been described as having reached epidemic proportions in western societies (Osborn & Smith, 2006). Indeed more than 50 million Americans are partially or completely disabled by chronic pain (Fordyce, 1995). Studies by the World Health Organisation suggest that an average of 22% of primary care patients across Asia, Africa, America and Europe report chronic pain severe enough to lead to health care consultation, medication use, or significant interference with life activities (Gureje, Von Korff, Simon & Gater, 1998). It is not surprising therefore that chronic pain is also the leading cause of work related disability (Maniadakis & Gray, 2000). In the UK there were 116 million days of work-related incapacity due to back pain during 1994-1995, costing an estimated £10,688 million (Maniadakis & Gray, 2000).

The search for a medical solution for chronic pain is often unsuccessful. For example, recent studies indicate that opioids rarely improve physical or emotional functioning (Turk, 2002) and 20% or fewer of lumbar surgery patients return to work (Franklin, Haug, Heyer, McKeefrey & Picciano, 1994). In one series of 388 injured workers treated with lumbar fusion, 68% reported that their pain was worse following surgery (Franklin et al., 1994). Despite insufficient evidence of their effectiveness however in 1990 about 279,000 surgical operations were performed for back pain in the USA (Nelemans, de Bie, de Vet & Sturmans, 2001; Taylor, Deyo, Cherkin & Kreuter, 1994). Consequently, the majority of patients with pain continue to suffer for many years without finding a cure (Elliott, Smith, Penny, Smith & Chambers, 2002, Crook, Weir & Tunks, 1989).

Many incidences of chronic pain exist without a medical explanation (Kleinman, Brodwin, Good & DelVecchio Good, 1992). For example, most cases of back pain are non-specific, having no clear link with an underlying organic pathology (Fordyce, 1995). The issue of the unexplained and invisible nature of pain has attracted a great deal of research interest, particularly in relation to stigma, self-blame and doctor-patient attitudes and communication (Johansson, Hamberg, Westman & Lindgren, 1999; Lillrank, 2003; Osbourne & Smith, 1998). Without an identifiable cause, the claims of the sufferer that they are in pain may be undermined, and questions may be raised by health care professionals and the patients' wider social circle about the extent to which the sufferer is responsible for his or her pain (Miles, Curran, Pearce & Allan, 2005; Eccleston, Williams & Rogers, 1997). These experiences can lead people to repeatedly seek treatment in an attempt to find a cure (Rhodes, McPhillips-Tangum, Markham & Klenk, 1999; McPhillips-Tangum, Cherkin, Rhodes & Markham, 1998) and/or withdraw socially, feeling 'disbelieved' and helpless about the future (Osborne & Smith, 1998).

Difficulties associated with Chronic Pain

The difficulties associated with chronic pain are considerable. Chronic pain can prevent people from engaging in a range of activities (Gamsa, 1994; Kerns, Turk & Rudy, 1985) challenge elements of everyday life that are usually taken for granted (Jackson, 1994; Morris, 1991), particularly independence, achievement, and social relationships (McCracken, 2005; Miles, Curran, Pearce & Allan, 2005), and consequently upset their sense of identity (Johansson et al., 1999; Osbourne & Smith, 1998).

In a national household survey of 805 adults with chronic pain conducted in the US, more than half reported that their pain prevented them from doing household chores or hobbies, participating in social activities, walking or having sex. About 80% said they were unable to exercise or sleep consistently, 41% reported disruption in work, and about 50% resorted to changing doctors to find more pain relief (Roper Starch Worldwide, 1999; as reported in McCracken, 2006).

The interruption that pain causes to everyday behaviours is exacerbated by the increasing frustration and low mood associated with thwarted attempts at engaging in fulfilling activities (Philips & Grant, 1991; Price, 1999; Riley, Robinson, Wade, Myers & Price, 2001, Riley, Wade, Robinson & Price, 2000; Wade, Dougherty, Archer & Price, 1996; Tait, 1999). Whilst interruptions in behaviours and reductions in activity can exacerbate low mood so can low mood lead to a reduction in activity (Beck, 1980). Therefore, perhaps it is unsurprising that this somewhat antagonistic relationship between pain, low mood and a narrowing behavioural repertoire exists.

Attempts to maintain pre-pain behaviours associated with a person's identity may also impact upon pain intensity (Chapman & Gavin, 1999; Pincus & Morley, 2001; Harris, Morley & Barton, 2003). In their 2005 study of 29 chronic pain sufferers, Miles, Curran, Pearce and Allan found that a desire to retain pre-pain normal lifestyles appeared to underlie people's use of coping strategies that exacerbate pain intensity and pain related disability. The authors argue that the degree to which pain challenges what people had previously accepted as 'normal' is illustrated through their evaluation of the impact of pain, in particular their perception of the constraints imposed by pain on what they can do (their activity levels) and who they can be (their identity). They identified four coping styles for managing perceived constraint - assimilation (whereby constraints are absorbed and normal life maintained), accommodation (when constraints are accepted and normal life re-defined), subversion (where attempts are made to retain pre-pain identities whilst minimising pain levels, through altering activities to a significant degree) or confrontation (where constraints are rejected and pre-pain identities and activities are pursued despite increasing pain levels). Confrontation, more often than not, led to increasing pain levels, and pain related disability.

If the struggle to retain a pre-pain identity or adopt a positive post-pain sense of self is unsuccessful, studies have indicated that a sense of hopelessness about the future accompanied by increasing levels of depression are more likely to occur (Morley, Davies & Barton, 2003; Harris et al., 2003). For example, Harris and colleagues (2003) asked 80 chronic pain patients to complete standardised measures of pain, disability, depression and anxiety. They also measured role and attribute loss using a Role-Attribute Test in which participants identified up to four social roles in four domains (friendship, occupation, leisure, family) and nominated up to two personal attributes in each role, one prior to pain onset and another that they currently held. Participants reported mean losses of 3.38 roles, and 6.97 attributes. Greater losses were observed in friendship, occupation and leisure domains compared with the family domain. Multiple regression analyses revealed that after controlling for demographic and clinical differences, role and attribute loss predicted depression scores. The unique variance explained by taking into account both role and attribute loss ranged between 6.7 and 12.5%. These correlations corresponded to medium to large effect sizes (Rosenthal, 1994). Additionally role and attribute loss were independently related to depression scores. The authors concluded that adjustment problems and depression in chronic pain are partly mediated by long-term interference with social roles and personal identity, not just moment-to-moment frustration with specific goals.

Increasing levels of depression can impact significantly on perception of pain intensity, whereby those with higher levels of depression report higher pain intensity and duration, although the nature of the mechanisms which underlie this relationship has been hotly debated (see Romano & Turner, 1985 for a review). A number of theories have been proposed to aid understanding of the mechanisms underpinning depression (e.g. Beck, 1980). Although these may be influential in explaining the maintenance of depression associated with chronic pain, the experience of chronic pain appears, in itself, to increase an individual's vulnerability to depression and hopelessness. Self reports given by individuals with chronic pain, as described in the next section, indicate the limitations pain places on an individual's sense of self, and the sense of hopelessness which may be associated with this (Johannsson et al., 1999; Osborn & Smith, 1998). Theories of self may therefore play an important role in enhancing our understanding of the experience of depression in chronic pain. Consequently the impact of chronic pain upon the self has become a valuable focus for study. The next section of this paper briefly reviews recent research in this area.

The self in chronic pain

The self is a complex and dynamic concept. Terms like self-concept, sense of self and identity are often used interchangeably in the literature, however, according to Osborn & Smith (2006) they most often refer to:

> "a stable but dynamic collection of core beliefs, constructs, affects or cognitions that are utilised by the individual to define themselves both privately and in their presentation to the outside world."
>
> (ll.26-30, p.216)

Research on the self in chronic pain has largely been focused on qualitative analyses of patients' accounts of their personal experience (Aldrich & Eccleston, 2000; Charmaz, 1999; Kotarba, 1983; Osborn & Smith, 1998; Hellstom, 2001; Hellstrom & Jasson, 2001; Johansson, Hamberg, Westman & Lindgren, 1999; Jones, 1985). A theme in many of these accounts is the loss of personal contacts and the impact of this on sense of self. For example, Osborn & Smith (2006) presented an in-depth, idiographic study of 6 patients with chronic pain. They concluded that the unpleasantness of chronic pain involves an assault upon and a defence of a preferred or desirable self. However, Asbring (2001) interviewed 25 women with CFS and fibromyalgia in Sweden, and identified the possibility of transcending the illness experience (Strauss, 1991), that is developing a new and more favourable identity through re-evaluation and renewal (Charmaz, 1991). These studies do not necessarily contradict each other; although the experience of chronic pain may challenge a person's sense of self, it could be that there are factors which enable individuals to overcome or transcend this challenge, possibly through re-evaluation of values and priorities.

These studies of chronic pain use a mixture of qualitative methods that consistently identify themes in which sufferers experience their selves as entrapped and limited by their pain or the symptoms associated with it, as described in the following excerpts:

> "I lost three years and just became immobilised at home because I thought that's what you should do if you wanted to live at all with something like this." (male with myasthenia gravis and peripheral neuropathy)
>
> (Charmaz, 1983, p.174)

> "I used to have a great number of friends, many parties and guests...Today I have no energy for all this. I really miss it...I want very much more than my body does...It makes me feel so useless not to be able to do all I want to do". (female with fibromyagia)
>
> (Hellstrom, 1998, p.14)

The experience of entrapment relates not only to the current experience of self, but also to a perception of the future, whereby future aspirations are dependent on a reduction or eradication of chronic illness (Hellstrom, 2001) as illustrated by the following quote:

> "I would like to take a vacation from it (the chronic illness) for 2, 3 or 4 weeks... That's all, I'm not asking much, just 4 weeks, you know, and then come back, and I'll be ok, but I can't do that.... And so it makes me think from time to time that I'm less human, and again I work my way out of that, but it is just a constant struggle to (do so)."
>
> (Charmaz, 1983, p.173)

Although these research papers tell an important, rich and valid story, the methodology is limited in that the themes cannot easily be systematically related to measured levels of constructs such as depression, functional (dis)ability and pain severity. More recently, a small number of empirically based studies of self-report data have been developed to explore the personal experience of chronic pain and to statistically test relationships between constructs of the self (e.g. self image, self-esteem) and other experiences (e.g. experiences of rehabilitation, length of time pain has been experienced; Gustatsson, Ekholm & Ohman, 2004; Hellstrom, Jansson & Carlsson, 1999; Osborn & Smith, 2006). In this approach the self remains an important phenomenon but there is an emphasis on the relationship between the self and subjective future self (i.e. how the pain patient perceives the future).

Earlier in this paper, we suggested that it was important to study the impact of chronic pain on the self since the impact of chronic pain on the self, rather than the experience of chronic pain per se, may contribute to an individual's levels of distress. In support of this, studies in this area have found that perceptions of a future with chronic pain (and the limitations of pain on a 'hoped for' self) are more predictive of current levels of distress than the experience of pain alone. For example, Hellstrom and colleagues (1999) analysed data from 660 chronic pain patients who completed The Multidimensional Pain Inventory (MPI), The Symptom Distress Checklist (SCL-90) and a Future Scale, which was constructed from items of the Sense of Coherence-Scale (Antonovsky, 1993). By using path analysis and structural equation modelling, they tested four latent constructs: pain, interference, distress and subjective future. The results indicated that subjective future self (in this case, the expectation of future troubles) is significantly related to distress and plays an important role in mediating the relationship between pain and distress.

In a further investigation of the relationship between chronic pain, perceived future and distress, Morley e al. (2003) hypothesised that depression would be associated with the degree to which a future possible self is dependent on the future absence of pain. They tested 89 patients with chronic pain from two pain clinics using standardised questionnaire measures of depression (Beck Depression Inventory, Beck, Steer & Brown, 1996), acceptance (Chronic Pain Acceptance Questionnaire, McCracken, Vowles & Eccleston, 2004), trait anxiety, pain related disability (Pain Disability Index, Tait, Chibnall & Krause, 1990), and pain (visual analogue scale). A structured interview based method was used to elicit patients' perceptions of their future possible selves. This included an assessment of the extent to which individuals' views of their selves were contingent on the absence (hoped for self) or presence (feared for self) of pain. The researchers found that on average, the patients' current self was nearer to their feared-for-future than to their hoped-for-future. Current depression was predicted by both actual-hoped for number of discrepancies and the proportion of hopes not contingent on pain removal. This was true after the influence of demographics, current pain and current levels of disability had been accounted for in a multiple regression analysis. Acceptance of pain was highly related to the proportion of hopes that were non-contingent on pain removal.

Both of these studies indicate an association between pain-enmeshment and distress. Those participants whose ideal future selves depended upon being pain-free experienced higher levels of distress. Although, the 'stories' of participants may have been lost in these analyses, it would have been difficult, if not impossible, to systematically relate these concepts using qualitative methodology, and important relationships between the dimensions of CP experience and levels of distress would have been overlooked. There still remains however serious limitations to studying self-report data, which may have important implications for the study of the self in chronic pain. These are discussed in the following section.

Limitations of current research on the self and Chronic Pain

Research on the self in chronic pain has traditionally been dominated by the use of verbal self-reports. Typically, participants are asked to describe their experience of chronic pain or to complete questionnaires, which aid them in describing their experiences. Many studies have shown substantial agreement between self-reported traits and ratings of these traits by others (Funder, 1999) indicating some face validity, however there are limitations to this approach.

The first of these limitations is the potential impact of social desirability or self presentation biases. Although our understanding of social processes which may lead to deception (such as faking of responses to create a certain impression), has increased, limited progress has been made in controlling for this (Paulhus, 1998). For example, in a study of racial prejudice, Devine (1989) found that indirect measures of attitudes revealed implicit racial prejudice among participants who reported low prejudice on a direct measure of prejudice. The unexplained and invisible nature of pain, as discussed earlier, can lead patients to feel that their claims are undermined (Miles et al., 2005; Eccleston, Williams & Rogers, 1997). These experiences can lead people to withdraw socially, feeling 'disbelieved', which can potentially affect their confidence in their ability to accurately report internal experiences and also their willingness to do so (Osborne & Smith, 1998). Research into the self in the field of chronic pain has focused on explicit measures and has not attempted to control for the impact of the problems discussed above and therefore the application of methodologies less susceptible to these biases may be extremely useful.

A second limitation relates to the limited cognitive accessibility we have to our inner mental states and processes (Asendorf, Banse & Mucke, 2002). Analysis of narrative accounts may enable us to consider the subjective experience of participants; but many studies have shown that people do not always have access to information regarding the causes of their actions. For example, Nisbett & Wilson (1977) report that humans are generally unable to report on their own experiences accurately, often choosing the most plausible and accessible explanations for their experiences even if these are misleading or inaccurate. They reviewed evidence, which suggests that there may be little, or no direct introspective access to higher order cognitive processes. They found that subjects are sometimes unaware of the existence of a stimulus that importantly influenced an action (Valins & Ray, 1967; Zimbardo, Cohen, Weisenberg, Dworkin & Firestone, 1969), unaware of the existence of an action (Bem & McConnell, 1970) or unaware that the stimulus has affected the action (Storms & Nisbett, 1970).

Accurate reports of cognitive processes will occur when influential stimuli are salient and are plausible causes of the responses they produce, and will not occur when stimuli are not salient or are not plausible causes. For example, Latane and Darley (1970) reported that although people are less likely to help others in distress as the number of other bystanders increases, individuals seem 'utterly unaware of the influence of the presence of other people on their behaviour', and indeed insist that their behaviour is not influenced by the presence of others, despite demonstrations of bystander apathy.

In recent years, researchers in social cognition have proposed that information about the self is processed in two different modes - an *explicit mode* within which conscious, controlled, and reflective information processing takes place and an *implicit mode* involving unconscious, automatic, and intuitive processes (Bargh, 1994; Bosson, Swann, & Pennebaker, 2000; Epstein, 1994; Greenwald & Banaji, 1995; Greenwald & Farnham, 2000; Kihlstrom & Cantor, 1984; Wilson, Lindsey, & Schooler, 2000). Dual-process models provide a useful framework for considering both forms of self knowledge (e.g., Epstein, 1994; Epstein & Morling, 1995; Smith & DeCoster, 2001; Wilson, Lindsey, & Schooler, 2000). These models infer that humans possess two modes of information processing – a *cognitive* mode, which is conscious, rational and deliberate, and an *experiential* mode, which is non-conscious, affective and automatic. According to this model, explicit knowledge of the self is based mostly on logical analysis of feedback and information about the self by the cognitive system, whereas implicit self knowledge is more primitive, develops earlier than explicit knowledge, and is derived from automatic processing of affective experiences, especially those early in an individual's life (Bosson, Brown, Zeigler-Hill & Swann, 2003; Epstein & Morling, 1995).

It can be inferred from this model that information processing in the explicit mode has only limited access to the self-concept and its affective evaluation (i.e., self-esteem), in particular, intuitive information about the self (including unfavourable or threatening evaluations), and information about the self acquired in early childhood, may be difficult to access in the explicit mode (Bowlby, 1969; Breakwell, 1986; Furman & Flanagan, 1997; George, Kaplan, & Main, 1985; Wilson, Lindsey & Schooler, 2000). Consequently, first hand accounts of the self, such as those historically used in studies of the self and chronic pain, may be at best incomplete or at worst inaccurate. Therefore the use of implicit as well as explicit methods is needed in this field. The following section discusses the use of implicit measures in the study of pain and psychological disorders then the application of these methods to the study of the self in chronic pain is considered.

Studies of implicit self and psychopathology

In the past decade, a number of implicit measures have been used within the field of chronic pain, particularly those which focus upon attentional and interpretative biases (using stroop, dot probe and homophone tasks), and memory recall. In their 2001 paper, Pincus and Morley present a comprehensive review of these studies. They report that individuals with CP display marked biases on attentional tasks compared to controls if a priming methodology (Segal, Gemar, Truchon, Guirguis & Horowitz,1995) or two stimuli choice task (Gilboa & Gotlib, 1997) is used. They also report consistent evidence of interpretive bias measured across three different experimental methods for illness- and health-related material (Pincus, Pearce & Perrott, 1996; Pincus, Pearce, McClelland, Farley & Vogel, 1994) and robust evidence for a memory bias in CP, particularly towards sensory pain descriptors (Johnson & Spence, 1997, Pearce, Isherwood, Hrouda, Richardson, Erskine & Skinner, 1990) using cognitive tasks. These findings demonstrate that there is some validity in applying experimental methods from cognitive psychology to chronic pain; however none have exclusively investigated the implicit sense of self within the context of chronic pain.

Explicit measurement of the self has a long history whereas attempts to capture and measure implicit self knowledge are much more recent (e.g. Greenwald & Banaji, 1995; Hetts, Sakuma, & Pelham, 1999; Kitayama & Karasawa, 1997; Spalding & Hardin, 1999). Although different types of procedures have been used to empirically assess implicit traits (See Fazio & Olsen, 2003, for a review) the Implicit Association Test (or 'IAT', proposed by Greenwald, McGhee, and Schwartz, 1998) remains one of the most empirically validated implicit measures (see Greenwald & Nosek, 2001, for a review based on over 30 published or in-press articles using the IAT).The IAT is a widely used methodology that was not initially designed to look at the self, but has been adapted by clinical researchers to investigate attitudes to the self in different types of psychopathology (see De Houwer, 2002, for a review).The task focuses participants' attention on making correct category membership judgements rather than explicit self evaluations. The speed (or *latency*) of the judgements is used as an indirect measure of attitude.

The IAT is based on the premise that categorisations congruent with implicit assumptions will be easier, and therefore quicker, than categorisations incongruent with implicit assumptions. The task has five stages. In each stage the participant is asked to categorise a series of words into two categories (see figure 1 for an example of categories used in IAT which measure implicit self esteem). In the example used in figure 1, a participant who views themselves positively would be quicker to categorise words into a self and positive (congruent) category than self and negative (incongruent) category. Therefore, a measure of the strength of implicit associations can be made by assessing the speed of categorisation of congruent and incongruent concepts. Those with stronger implicit associations will exhibit larger differences in their speed to categorise congruent vs. incongruent concepts than those with weaker implicit associations. The IAT effect is calculated by comparing performance in the 3rd and 5th steps. If the subject responds more rapidly in the *self-or-positive* versus the *other-or-negative* task than in the *self-or-negative* versus the *other-or-positive* task, this indicates that, in combination, the *self-positive* and *other-negative* associations are stronger than the *self-negative* and *other-positive* associations.

Steps	Concepts for left response	Concepts for right response
1	Self	Other
2	Positive	Negative
3	Self or Positive	Other or Negative
4	Negative	Positive
5	Self or Negative	Other or Positive

Figure 1. Illustration of an Implicit Association Test to measure self-esteem (Greenwald & Farnham, 2002).

Given that chronic pain presents a challenge to an explicit sense of self, it may be hypothesised that an underlying (or implicit) sense of self will also be impacted, causing individuals to evaluate themselves more negatively in subtle, perhaps unconscious, ways. However, the relationship between explicit and implicit levels of self-esteem is not always this straightforward. Surprisingly, depressed and anxious individuals have been found to demonstrate positive implicit self esteem scores, For example, De Raedt, Schacht, Franck, and De Houwer (2006) assessed implicit self esteem in currently depressed individuals and non-depressed controls using three different paradigms: the Name Letter Preference Task (NLPT; Nuttin, 1985, 1987), the Extrinsic Affective Simon Task (EAST; De Houwer, 2003), and the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). The results clearly indicated positive implicit self-esteem on all three measures of implicit self-esteem. There was no difference between currently depressed patients and never depressed controls. Also, de Jong (2002) used a conventional IAT to examine self- and other-esteem and found that although both high and low socially anxious participants showed a bias towards associating positive words with self.

It could be that the relationship between distress and implicit self esteem in more subtle than that of distress and explicit self esteem, since although anxious and depressed individuals demonstrate positive implicit self esteem, differences have been found in levels of positive implicit self esteem between groups with high and low anxiety. Also, implicit self esteem has been found to predict depressive relapse.

For example, in de Jong's (2002) study, the positive implicit bias demonstrated by a high socially anxious group was weaker than a low socially anxious group. Critics of this study have argued that the absence of a social threat activation task might mean that these studies did not demonstrate the full extent of negative attitudes towards the self. Consequently, Tanner, Stopa and De Houwer (2006) investigated implicit attitudes to self in high and low socially anxious participants using an IAT following a social threat activation (giving a short speech). Both groups had positive implicit self-esteem on the IAT, however implicit self-esteem as measured by the IAT was significantly less positive in the high socially anxious group than in the low anxious group. This difference cannot be explained by differences in depression because, unlike de Jong's studies, levels of depressive symptoms were controlled.

In an attempt to investigate the relationship between depression and implicit self esteem, Franck, De Raedt and De Houwer (2007) researched the predictive validity of implicit self-esteem for depressive relapse. They assessed implicit self-esteem using the Name Letter Preference Task and explicit self-esteem using the Rosenberg self-esteem scale in a group of currently depressed patients, formerly depressed individuals, and never depressed controls. In line with previous research, there was no difference between the groups in implicit self-esteem, however after controlling for depression, implicit but not explicit self-esteem significantly predicted depressive symptoms at six months follow-up. It could be that, like findings in the chronic pain field, rather than current symptomatology per se, an individual's perception of the impact of current problems on a future self, may predict distress.

These studies of implicit self in relationship to psychopathology have demonstrated subtle discrepancies between measures of explicit and implicit self-esteem. A number of interpretations of these results have been made. As discussed in Tanner, Stopa & De Houwer (2006), de Jong (2002) argues that when high socially anxious individuals report low levels of self-esteem using explicit self-report measures this reflects self-presentational concerns rather than genuinely low self-esteem. Koole, Dijksterhuis, and Knippenberg, (2001) suggest that implicit and explicit evaluations of the self may reflect two qualitatively different kinds of self-evaluation, and that implicit judgements are likely to be more positive since they reflect primitive functions of self-enhancement and protection.

The Implicit Association Test has been rarely used in the field of chronic pain, therefore very little is known about implicit associations associated with chronic pain. Armstrong, Wittrock and Robinson (2006) used an IAT to test whether tension-type headache patients (*n*=19) displayed stronger associations between negative events and headache-related information than headache-free controls (*n*=19). As hypothesized, tension-type headache patients displayed associations between negative evaluations and headache-related information, whereas the control group did not. The IAT did not however consider associations between positive and negative concepts and the self, therefore the relationship between implicit self and pain was not considered, this study does however report that IAT methodology was been successfully used with a group experiencing pain.

If the relationship between explicit and implicit views of self does reflect a complex picture, then the impact of chronic pain on an underlying sense of self is also likely to be complex given the number of ways in which pain affects the self. To begin with the discrepancies between implicit and explicit self-esteem indicate that it is important to measure both rather than assuming that they are the same. In particular, given the explicit reports of challenges to the self and the additional difficulties that chronic pain brings such as feeling blamed or not believed, it would be interesting to investigate for example whether the implicit sense of self is less positive for those who experience chronic pain than for those who do not have a chronic health problem.

In the only (identifiable) published study of somatic symptoms and implicit self-esteem to date, Robinson, Mitchell, Kirkby and Meier (2006) used IAT methodology to investigate associations between levels of implicit self-esteem as measured by an IAT and somatic symptoms in 157 undergraduates. As predicted by the researchers, correlations between implicit self-esteem and somatic complaints such as muscle soreness, headaches, and breathing difficulties were robust and negative in direction, as measured by a questionnaire designed to tap anxious arousal, momentary and daily reports of somatic symptoms, and informant reports – lower levels of implicit self-esteem as measured by the IAT were associated with higher ratings of somatic symptoms. The authors argued that lower levels of implicit self-esteem are associated with tendencies to internalize negative evaluations, in turn biasing bodily symptom perception. This finding is interesting, but there have been no attempts to extend similar investigations to chronic pain patients or other patient (rather than undergraduate) groups with somatic symptomatology.

Further Investigation of the self in Chronic Pain

This review of current knowledge of the impact of CP on the self has indicated a number of important themes. For example, as discussed in the first three sections of this paper, self-report studies of the self and CP indicate that for many individuals chronic pain presents a challenge to the self. In particular, recent empirical studies indicate that those who feel enmeshed with their chronic pain tend to experience higher levels of pain, dysfunction and negative affect (Morley, Davies & Barton, 2003; Harris, Morley & Barton, 2003). Most of this research has been conducted by a group of researchers in pain clinics in the North of England; therefore further replication of these results nationally and internationally would be important to ensure the reliability of these findings. It may also be useful to consider if illness-enmeshment is unique to chronic pain, or a characteristic of other chronic illnesses. This may enable exploration of the characteristics of chronic illnesses which contribute to enmeshment.

A second important theme of this review was the limitations of the self-report methodology that has dominated this field. As discussed in the fourth section of this paper, these methods are susceptible to a number of biases, which are particularly relevant in chronic pain. Additionally, in recent years, social cognition researchers have proposed that information about the self is processed in two different modes – a conscious, controlled and reflective *explicit mode* (as investigated by self-report) and an unconscious, automatic and intuitive *implicit mode*, (accessed by implicit tasks, such as the IAT) which has hitherto been neglected by research in this area.

Preliminary evidence suggests that implicit measures might have an important contribution to make to the area (Pincus and Morley, 2001) however little of the work on cognitive processes in pain has focused on implicit measures of the self. The fifth section of this paper, discussed how the IAT, a widely used measure of implicit self, has been applied to studies of the self in psychopathology. Given current research interest in the enmeshment of the self with chronic pain, and the developing perceptions of the relationship between perceptions of somatic symptoms and implicit self-esteem, implicit methodologies such as the IAT may provide an insight into unconscious processes that underlie adjustment to chronic pain.

In conclusion therefore this paper has discussed the impact that chronic pain has on the self and the ways that this has been researched. Chronic pain appears to have an impact not only upon an individual's current sense of self, but also their sense of who they might be. In particular, the perceived limitations that chronic pain places on a person's future (or their enmeshment with pain) appears to be closely related to their current levels of distress. Whether this phenomenon is unique to chronic pain or found in other chronic illnesses remains to be investigated. Research into the self in chronic pain has focused on explicit methodologies; the impact of chronic pain on the implicit sense of self has not been investigated. Future research using implicit methods, such as the IAT, would provide an insight into the implicit self in chronic pain, which would not only contribute to the study of chronic pain but also to our understanding of the implicit self.

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Empirical Paper:

Self identity and chronic illness:

Is self-illness enmeshment unique to chronic pain?

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Running Head: SELF IDENTITY AND CHRONIC ILLNESS

Abstract

Objective: The study aimed to investigate whether self-illness enmeshment is unique to chronic pain using explicit measures of self and whether the implicit sense of self is less positive for those who experience chronic conditions than for healthy controls. **Method:** Three groups of participants; a group with chronic pain ($n = 15$), a group with type 2 diabetes ($n = 15$) and a healthy control group ($n = 15$) completed standardized self-report measures of affect and quality of life, then generated characteristics describing their current actual self, hoped-for self and feared-for self, and made judgments about the degree to which their future possible selves (hoped-for and feared-for) were dependent on a change in their current health status. They then completed a self-esteem version of the Implicit Association Test. **Results:** The chronic pain group were more enmeshed with their current health status and had a less positive implicit sense of self than participants with no chronic health problems. Participants with diabetes did not significantly differ from the other two groups on these measures with the exception of higher levels of illness-enmeshment with a feared-for self. **Conclusion:** This result is discussed in relation to self-discrepancy and self-regulatory theories and other research on illness-enmeshment and implicit self-esteem biases in clinical populations.

KEYWORDS: chronic illness, self identity, self-esteem, enmeshment, implicit.

Self identity and chronic illness

The difficulties associated with chronic pain (that is, pain that persists in the absence of tissue damage and for longer than 6 months) are considerable. Chronic pain can prevent people from engaging in a range of activities (Gamsa, 1994; Kerns, Turk & Rudy, 1985) and challenge elements of everyday life that are usually taken for granted (Jackson, 1994; Morris, 1991), particularly independence, achievement, and social relationships (McCracken, 2005; Miles, Curran, Pearce & Allan, 2005). Consequently, many people with chronic pain experience low mood and become increasingly frustrated with the limitations chronic pain places on their life (Philips & Grant, 1991; Price, 1999; Riley, Robinson, Wade, Myers & Price, 2001; Riley, Wade, Robinson & Price, 2000; Wade, Dougherty, Archer & Price, 1996; Tait, 1999).

A number of theories have been proposed to aid understanding of the mechanisms underpinning depression in emotional disorders (e.g. Beck, 1980). Although these may be influential in explaining the maintenance of the depression associated with chronic pain, researchers have also suggested that chronic pain places limitations on individual's sense on the self, increasing their vulnerability to depression and hopelessness (Johansson, Hamberg, Westman & Lindengren, 1999; Osbourne & Smith, 1998). Theories of the self may therefore aid our understanding of the experience of depression in chronic pain. There are a number of theories of self; however two seem particularly relevant to the experiences of pain that individuals describe, in that they describe the discrepancy between an ideal and an actual self (e.g. a self thwarted by pain).

Self-discrepancy theory (Higgins, 1987) is a theory from the field of social psychology, which focuses on how different types of discrepancies between self representations are related to different kinds of emotional vulnerabilities. For many years, social psychologists have proposed that people who hold conflicting or incompatible beliefs are likely to experience discomfort. Higgins applies this to the concept of different self representations, proposing that the discrepancy between an individual's 'ideal' and 'actual' self will be associated with his or her level of depression.

Self-regulatory theory (Carver & Scheier, 1998), which also heralds from the field of social psychology, holds a similar premise to self-discrepancy theory, in that it also purports that a discrepancy between the ideal and actual self will result in negative affect, however it furthermore states that a person's negative affect is *directly related* to the rate at which the distance between their ideal and actual self is changing. If the individual perceives that the route to the ideal self is blocked, depression and frustration ensue (Morley et al., 2005).

Predictions made by these theories have been supported by recent research (Morley et al., 2005; McCracken & Eccleston, 2003), which has found that the degree of 'entrapment' that chronic pain patients experience (that is, the extent to which they feel their illness limits who they are and what they can be - sometimes described as the 'enmeshment' of the person with their illness) is related to their self-reported level of depression. Additionally chronic pain patients consistently report feeling entrapped and limited by their pain (Hellstrom, 2001; Hellstrom & Jansson, 2001). Indeed, a recent study found that 44% of 'hoped-for' future characteristics that 89 chronic pain patients reported were reliant on the absence of chronic pain (Morley et al., 2005).

This work has a number of clinical implications, since assisting patients to retain their identity and build positive hoped-for characteristics that can be achieved in the presence of their chronic condition may aid psychological well-being. However, whether the discrepancy between actual and ideal self is unique to chronic pain, or is also a characteristic of other chronic conditions, is not yet known. In order to investigate whether self-discrepancies are specific to chronic pain, this study compares measures of sense of self in three groups: chronic pain patients, patients with a different chronic illness (diabetes), and healthy non-patient controls.

Despite the fact that Diabetes is a chronic and potentially life threatening illness, the current evidence suggests that most individuals with the disorder effectively manage their condition with medication and are able to maintain full-time employment. Sixty-nine percent of adults of working age with diabetes are currently employed compared to 60 per cent of people with chronic pain who report they are less able or unable to work outside home and around a fifth have lost their job due to pain (figures based on European data only, Breivik, Hattori, Moulin & Dwight, 2005). Since chronic pain appears to restrict daily functioning more than diabetes, routes to the ideal self may appear to be 'blocked'. Therefore, if the self-regulatory theory (Carver & Scheier, 1998) is applied to experiences of chronic conditions, it is more likely that individuals with chronic pain would experience greater discrepancy between ideal and actual self and a have less positive sense of self that those with diabetes.

The impact of chronic pain on explicit sense of self (i.e. self-reported aspects of identity) has been of interest to researchers and clinicians for some years, but the impact of chronic pain on implicit self-identity (that is, an underlying sense of self, which may not be accessible by direct questioning) has yet to be established. If chronic pain presents a challenge to the individual sense of self, it is possible that there will be an impact on the underlying (or implicit) sense of self, which might lead individuals to evaluate themselves more negatively in subtle, perhaps unconscious, ways. However, the relationship between explicit and implicit levels of self-esteem is not always this straightforward. Studies of the self in relation to psychopathology indicate subtle discrepancies between levels of implicit and explicit self-esteem. The impact of psychopathology on the underlying sense of self is therefore complex. Nonetheless, in the field of chronic pain, where individuals may report feeling a burden or feeling 'disbelieved', the use of measures of the self which address presentation biases is especially relevant.

The implicit attitude test (IAT), is a widely used task for measuring implicit self-esteem which could be applied to research the impact of chronic illness on the individual's underlying sense of self. The task focuses participants' attention on making correct category membership judgements rather than asking them to make explicit self evaluations. Relative strengths of associations between concepts and attributes in each category are made, for example the associations between concepts flower and insect and the attributes positive and negative. The speed (or *latency*) of the judgements is used as an indirect measure of attitude. Greenwald & Farnham (2000) adapted the IAT to measure self-esteem using the categories of 'self' (e.g. me) and 'other' (e.g. you), paired with positive (e.g. loved) and negative (e.g. hated) categories. Those with stronger implicit associations will exhibit larger differences in their speed to categorise congruent vs. incongruent concepts than those with weaker implicit associations. For example, a participant who views themselves positively would be quicker to categorise words into a self and positive (congruent) category than self and negative (incongruent) category. Therefore, a measure of the strength of implicit associations can be made by assessing the speed of categorisation of congruent and incongruent concepts.

The aim of this study was therefore twofold, firstly to investigate whether self-illness enmeshment is unique to chronic pain using explicit measures of self and secondly to investigate whether the implicit sense of self is less positive for people who experience chronic conditions than for those who do not have a chronic health problem. In accordance with the self-regulatory theory, we hypothesised that participants in the chronic pain group would have significantly more ideal self characteristics, which are conditional on a change in their health (the absence of their chronic condition) than participants with diabetes. We also predicted that participants in the chronic pain and diabetes groups would have a significantly larger discrepancy between actual and ideal self than participants in the healthy non-patient (control) group, and that this discrepancy would be greater for participants with chronic pain than for those with diabetes. We additionally hypothesised that, according to explicit reports of the impact of chronic conditions on the self, participants in the chronic pain and diabetes groups would have a significantly less positive implicit sense of self, as measured by the IAT, than those in the healthy non-patient (control) group and that the implicit sense of self will be less positive for participants with chronic pain than for those with diabetes. We also planned to investigate the association between the impact of the chronic illness on functioning (measured by quality of life) and self identity. We predicted that lower quality of life scores would be associated with higher levels of enmeshment and less positive implicit sense of self.

Method

Design

The study used a between subjects quasi-experimental design, which incorporated questionnaire and computer based methodology. Participants were recruited for one of three groups depending upon their experience of chronic illness. The independent group factor was group (chronic pain, diabetic, (healthy) control). The within group factors were explicit self-illness enmeshment (i.e. the proportion of ideal self-characteristics which could be achieved in the presence of a chronic condition), ideal/actual self-discrepancy score (the number of matches between ideal and actual self minus the number of mismatches), and implicit positive sense of self (the implicit association between 'me' and 'positive' characteristics). The quality of life of the group members was used to control for the severity of the chronic illness. The total sample size ($n = 45$; i.e. 15 per group) was determined using an effect size from a published IAT study (Nosek, Greenwald & Banaji,, 2005; $\beta = 0.94$) for 80% power with alpha = 0.05.

Participants

Participants with chronic pain (n=15; 12 females, 3 males) were recruited from psychology waiting lists at an NHS Pain Clinic in the South of England. This means that they had gone through a triage process, where they had been seen by a medical consultant who confirmed that they had been experiencing chronic pain. Within the pain group, participants had been diagnosed with a range of conditions including fibromyalgia ($n = 4$), prolapsed discs ($n = 2$), osteoarthritis ($n = 1$), sciatica ($n = 1$), secondary sjogrens syndrome ($n = 1$) and ankylosing spondylitis ($n = 1$). Five participants in the pain group had received no formal diagnosis. All chronic pain participants had experienced pain for at least 6 months (mean = 15.2 years, SD = 11.6 years). The mean time from first symptoms of pain to diagnosis of chronic pain for the group was 4.5 years (SD = 4.3 years).

Participants with type 2 diabetes (n =15; 12 females, 3 males) were recruited from diabetes support groups across the South of England. All diabetes participants had been diagnosed as having type 2 diabetes by a medical practitioner. The mean length of time of living with the chronic illness (mean = 9.0 years, SD = 11.6 years) was not significantly shorter than the chronic pain group (t (28) = 1.73, p = .095). The mean time from first symptoms of the chronic illness to diagnosis (mean = .5 years, SD = .9 years) for the group was, however, significantly shorter than the chronic pain group (*t* (23) = 3.54, p =.002).

A control group of participants with no chronic illnesses (n=15; 13 females, 2 males) was recruited from non-academic staff population at the University of Southampton (secretaries, cleaners etc) and from staff at a local government office. The control group only included (based on self-report) those who had never had a chronic illness. All participants were aged between 18 and 70 and spoke English as a first language.

There was a significant difference between the ages of the groups (F (2, 42) = 6.15, p = .005). The diabetes group (mean age = 63.0 years, SD = 14.5 years) was significantly older than the pain (p = .011; mean age = 49.9 years, SD = 10.2 years and control (p =.002; mean age = 46.5 years, SD = 15.5 years) groups, however (as described in the results section) due to the non-parametric nature of the illness-enmeshment and IAT scores, the differing mean ages of the groups could not be controlled in subsequent analyses. The three groups did not however differ in reading test (NART) scores (F (2, 42) = 1.36, p = .269) or in gender distribution (Kruskal-Wallis χ^2 = .331, df = 2, p = .85).

Measures

WHO-QOL-Bref (Harper & Power, 1998)

The WHO-QOL-BREF scale is a 24 item scale abbreviated version of the WHO-QOL-100 quality of life assessment. It produces scores based on five domains related to quality of life: physical health, psychological, social relationships, environment, and overall quality of life and general health. Scores produced by the WHO-QOL-BREF correlate highly (0·89 or above) with WHO-QOL-100 scores.

WHO-QOL-BREF scores also demonstrate good discriminant validity, content validity, internal consistency and test–retest reliability (Harper & Power, 1998).

Flanagan's Quality of Life Scale (Burckhardt, 1985)

Flanagan's Quality of Life Scale is a 16 item self-administered quality of life scale designed for use with patients with chronic illness. It was developed from interviews with 204 individuals with chronic illness (including diabetes) and has been used in a number of clinical trials, including a trial of fibromyalgia (Burckhardt, Mannerkorpi, Hedenberg & Bjelle, 1994). It is reported to have good test re-test reliability, internal consistency and content and construct validity (Burckhardt, Woods, Schultz & Ziebarth, 1989).

National Adult Reading Test (NART, Nelson, 1982).

The NART is used in research and clinical settings to provide an estimate of IQ. The participant is asked to read aloud 50 words that are not pronounced phonetically. This test has been extensively used in both clinical and research settings, and it has been demonstrated to be reliable, having good test-retest reliability, and valid, demonstrating good criterion validity (Crawford, Parker, Stewart, Besson & De Lacey, 1989; O'Carroll, 1987).

The Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983)

The HADS is a 14 item self-report measure of depressive and anxious symptomatology initially designed to assess mood disorder in medical practice settings. Each item has 4 possible responses. The scores for each item range from 0 to 3, depending on the symptom's presence and severity over the preceding week. Two separate scores (ranging from 0 to 21) are calculated for anxiety and depression. The HADS has been demonstrated to hold good levels of content validity and reliability in community settings and primary care medical practice (Bjelland, Dahl, Haug, Neckelmann, 2002).

Ideal (Possible) Selves Interview (Morley et al., 2005)

In the Possible Selves Interview participants generate sets of 10 personal descriptors (characteristics) that describe three aspects of their selves: their actual self (self as it is now), their hoped for self and their feared for self. They are then asked to judge whether each characteristic would be possible if they were at the same level of health as they currently are (for chronic pain and diabetes groups this means if they still had their chronic condition). Following this, they are asked to make two ratings: (i) Efficacy – how capable they feel they are of accomplishing/avoiding the hoped for/feared for self (1 = not at all capable, 7 = definitely capable) (ii) Expectancy – how likely they think that their hoped for/feared for self will describe them in the future (1 = very unlikely, 7 = very likely).

Apparatus and Stimulus material

Implicit Attitude Test (IAT) (*Greenwald, McGhee & Schwartz, 1998*)

The Implicit Association Test (IAT, Greenwald, McGhee & Schwartz,1998) is a computer based reaction time paradigm which has acceptable test-retest reliability ($r = .69$; Bosson, Swann, & Pennebaker, 2000) and which measures implicit associations between different categories of stimuli. An IAT which measured implicit positive and negative views of self was developed and programmed using an INQUISIT 6.0 (Millisecond, 2006) software package and administered on an Ergo, Preceptor 601 laptop computer.

The IAT involved pairing positive (smart, bright, success, splendid, valued, strong, loved, honest, competent and nice) and negative (stupid, ugly, failure, awful, useless, weak, hated, guilty, awkward and despised) attribute words with target concepts of 'self' (I, me, my, mine and self) and 'other' (they, them, their, you and other). The words used were identical to the ones used in a study by Greenwald and Farnham (2000) to measure self-esteem and self-concept. The same words were used for all participants, and they were presented randomly within each trial. The two sets of words (positive vs. negative, self vs. other) did not differ significantly in word frequency (according to norms reported by Kucera and Francis (1967); pos/neg: $U = 41.5, p = .78$; self/others: $U = 3.0, p = .08$), number of letters (pos/neg: $U = 46.0, p = .80$; self/others: $U = 4.0, p = .07$), or number of syllables (pos/neg: $U = 34.5, p = .25$; self/others: $U = 10.0, p = .32$).

The IAT instructions appeared in the middle of a black background screen in a 19 by 14cm information box. Category labels (negative and positive; me and other) appeared positioned in the outer left and the outer right hand top corner of the box in lower case letters. The test words appeared in the middle of the box in capitals. Participants sorted the test words into appropriate categories by pressing 5 on the keyboard for words associated with the right hand category and A for words associated with the left hand category.

Each IAT consisted of 5 blocks of trials. Blocks One, Two and Four (the 'practice' blocks) consisted of 20 response trials. Blocks Three and Five (the 'test' blocks) consisted of 40 response trials. In the first block of the IAT, participants were asked to categorise test words into either 'self' or 'other' words using the A and 5 response keys respectively. In the second block, the task was to categorise test words into either 'positive' or 'negative' using the same response keys (i.e. A for positive, 5 for negative). The third block combined the first two tasks. Participants were asked to categorise test words into 'positive or self' by pressing A and 'negative or other' words by pressing 5 (the keys corresponding to the first two blocks). The fourth block reversed the response requirements for the second block (i.e. 5 was pressed for positive words, A for negative). Finally, in the fifth block participants categorised test words into 'negative or self' by pressing A and 'positive or other' by pressing 5, incorporating the reversal made in the previous block.

The presentation of the order of the test blocks was counterbalanced to reduce possible task order effects (Farnham, Greenwald & Banaji, 1999). To alert participants to errors, the word ERROR was presented in red capitals in the middle of the test word box following an incorrect categorisation. Participants did not need to press the correct response key in order for the next word to appear.

Calculation of the IAT D-effect

An improved scoring algorithm proposed by Greenwald, Nosek & Banaji (2003) was used to evaluate implicit self-esteem as measured by the IAT. This involved the computation of an IAT-D effect. Only data from the 80 trials within blocks 3 and 5 was used in the analysis. Firstly, data from the first trial in each block and trials with latencies greater than 10,000ms was deleted. Any blocks where more than 10% of the trials had latencies less than 300ms were deleted. A mean score was then calculated for each block and any errors were replaced with the block mean score plus a penalty of 600ms. Finally, a difference score was calculated between the mean scores on the two test blocks by subtracting the congruent block score from the incongruent block score.

The resulting IAT-D effect is a measure of the association one has with the self. Individuals who are quicker to categorise words in the self and positive (other and negative) categories than the self and negative (other and positive) categories will have positive scores, indicative of positive implicit associations with the self. Those quicker to categorise the self and negative rather than self and positive categories will have negative scores, indicative of negative implicit associations (Tanner, Stopa & De Houwer, 2006).

Procedure

Since this multi-centre study involved NHS patients, ethical approval was gained from the School of Psychology Ethics Committee, University of Southampton, and the Medical Ethics Board (COREC). Participants with chronic pain were tested at a pain clinic in the South of England, participants with diabetes were tested at the University or in their own homes, and participants in the healthy control group were tested at the University. In each testing session, participants read an information sheet and were reminded verbally about confidentiality and their right to withdraw from the study at any point. Next, they signed a consent form and all participants completed the WHO quality of life and HADS questionnaires. Participants in the pain and diabetes groups then completed the Flanagan quality of life scale. After this the researcher led the participants through the scripted 'possible selves' structured interview. The script (amended for those with no chronic illness as detailed in Appendix A) is based on that presented by Morley, Davies and Barton (2005). After this, all participants completed the National Adult Reading Test and the IAT. Finally all participants were thanked and debriefed.

Results

Statistical analysis was conducted using SPSS, version 14.01. Significance levels were set at an alpha value of 0.05 and all tests were two-tailed. Where data did not meet the assumptions required to perform parametric analysis, non-parametric equivalents were performed.

Self-report data

Quality of Life and Mood questionnaires

There was a significant difference between the three groups in quality of life as measured by the WHO-QOL ($F(2,42) = 22.76, p = .001$); and depression ($F(2,42) = 9.341, p = .001$) but not anxiety ($F(2,42) = 1.68, p = .20$) as measured by the HADS. The WHO quality of life scores for the pain group (mean = 66.67, SD = 12.37) were significantly lower than for the diabetes ($p = .001$; mean = 89.47, SD = 14.87) and control ($p = .001$, mean = 94.60, SD = 9.92) groups. The depression scores for the pain group (mean = 7.33, SD = 3.40) were also significantly higher than for the diabetes ($p = .01$, mean = 4.47, SD = 3.27) and control ($p = .001$, mean = 2.73, SD = 1.94) groups. There was no significant differences between the WHO-QOL ($p =.35$) and depression ($p =.11$) scores for the control and diabetes groups. The same patterns of differences in WHO-QOL scores across groups remained when depression was controlled in the analysis (F (3, 41) = 44.278; p = .002; pain group scores were significantly lower than scores from the diabetes (p = .001) and control (p = .004) groups; there were no significant differences between scores from diabetes (p = .753) and control groups). The pain group also scored significantly lower ($t(28) = -4.34, p = .001$; mean = 68.60, SD = 9.546) on the Flanagan Quality of Life Scale than the diabetes group (mean = 86.33, SD = 12.37).

Ideal (Possible) Selves Task

a. Efficacy and Expectation Data

Ratings of efficacy (how effectively a hoped-for self could be achieved and a feared-for self could be avoided) and expectation (how likely the hoped-for and feared-for selves would describe them in the future) were calculated by dividing the total efficacy or expectation value for all characteristics in the hoped for or feared for section by the number of characteristics described in each section.

There was a significant difference between the three groups in their ratings of efficacy of achieving a hoped-for self (Kruskal-Wallis $\chi^2 = 15.22$, $df = 2$, $p = .001$). The pain group (Mean = 3.52, SD = 1.77) rated themselves as less able to achieve a hoped-for self than the diabetes (U = 48.5, p = .007; Mean = 5.21; SD = 1.45) or control (U = 23.0, $p = .001$; Mean = 5.99; SD = 1.13) groups. There was no difference however (Kruskal-Wallis $\chi^2 = 2.36$, $df = 2$, $p = .31$) between the groups in the ratings of efficacy of avoiding a feared-for self (Pain, Mean = 3.57, SD = 1.72; Diabetes, Mean = 4.36; SD = 2.15; Control, Mean = 4.32; SD = 1.13).

There was also a significant difference between the groups in their ratings of the hoped-for self describing them in the future (Kruskal-Wallis $\chi^2 = 11.31$, $df = 2$, $p = .004$). The pain group (Mean = 3.44, SD = 1.82) least expected themselves to achieve the hoped for self compared to the diabetes ($U = 46.0$, $p = .006$; Mean = 5.26; SD = 1.48) and control groups ($U = 39.5$, $p = .002$; Mean = 5.50; SD = 1.25). There was no difference, (Kruskal-Wallis $\chi^2 = 2.95$, $df = 2$, $p = .23$) however, between the groups in the ratings of the feared-for self which described them in the future (Pain, Mean = 3.98, SD = .92; Diabetes, Mean = 3.44; SD = 1.61; Control, Mean = 3.43; SD = .99).

b. Self-enmeshment Data

Measures of self-illness enmeshment (proportions of self characteristics that are conditional on a change health status) were calculated from the responses given by all participants. These measures are the conditional hoped-for self and the conditional feared-for self (Morley et al., 2005).

The conditional hoped-for self in this study was the proportion of hoped-for self characteristics that could not be achieved at the present level of health. The measure therefore, represents how much of the hoped-for future self is dependent on a change in the health status of the individual. For example, according to Morley, Davies and Barton (2005), a participant in the chronic pain group reporting that the hoped-for future can only occur if the characteristics are realizable in the absence of pain is considered to be highly enmeshed. Conversely if all of the hoped-for characteristics can be achieved at the level of health currently experienced then enmeshment is minimal. Thus a high score on the conditional hoped-for self represents high enmeshment with current health status. The conditional feared-for self was computed as the proportion of feared-for self characteristics that could not occur were current health status to be changed. A high score on the conditional feared-for self reflects a high level of enmeshment.

There was a significant difference between the groups in conditional hoped for self scores (Kruskal-Wallis $\chi^2 = 24.72$, $df = 2$, $p = .001$). The pain group (Mean = .53, SD = .34) was significantly more enmeshed with their health than the diabetes ($U = 18.5$, $p = .001$; Mean = .06, SD = .11) and control ($U = 16.5$, $p = .001$; Mean = .05; SD = .11) groups. There was also a significant difference between the groups in conditional feared for self scores (Kruskal-Wallis $\chi^2 = 11.54$, $df = 2$, $p = .003$). However, on this measure, the diabetes group (Mean = .67, SD = .37) was significantly more enmeshed with their health than the control group ($U = 35.5$, $p = .001$; Mean = .22; SD = .23). There was no significant difference in feared for enmeshment between the diabetes and pain groups ($U = 69.5$, $p = .074$; Mean = .44, SD = .36) or between the pain and control groups ($U = 68.5$, $p = .067$).

c. Self discrepancy Data

Self discrepancies between the actual-self and the hoped-for self (actual/hoped-for discrepancy) and the actual-self and the feared-for self (actual/feared-for discrepancy) were computed using the method employed by Higgins and colleagues (Higgins, Bond, Klein & Strauman, 1986). This method identifies the number of matches (identical words and synonyms) and mismatches (opposites and antonyms) in pairs of selves (actual/hoped-for and actual/feared-for). Synonyms and antonyms were identified using an online English language thesaurus (www.thesaurus.co.uk). The self-discrepancy is the number of mismatches minus the number of matches; words which are neither a match or mismatch are nonmatches and were not included in the calculations. Positive scores therefore, represent higher levels of self-discrepancy. All data sets was sampled and scored by a second independent rater who was blind to which groups participants were in. Inter-rater reliability was highly significant (Kappa = .77, $p = 0.001$).

There was no significant difference between the groups in actual/hoped for discrepancies (Kruskal-Wallis $\chi^2 = 3.453$, $df = 2$, $p = .178$), or actual/feared for discrepancies (Kruskal-Wallis $\chi^2 = .118$, $df = 2$, $p = .934$) however total scores of fear matches and hope mismatches were low across the group (Total fear matches = 4; Total fear mismatches = 40; Total hope matches = 45; Total hope mismatches = 8).

Implicit Association Test

Table 1 shows the means, standard deviations and ranges for the IAT-D effect.

IAT measurement	Group	Mean (*SD*)	Minimum	Maximum
Congruent block	CP	1278.09 (413.51)	861.56	2447.47
	D	1327.03 (311.26)	887.36	1897.82
	HC	1089.55 (256.45)	689.26	1684.64
Incongruent block	CP	1547.03 (371.53)	930.00	2142.23
	D	1966.61 (746.65)	860.56	3854.14
	HC	1685.97 (364.67)	1157.08	2479.42
IAT-D effect	CP	.3428 (.526)	-0.93	0.85
	D	.5649 (.586)	-1.04	1.27
	HC	.8222 (.210)	0.38	1.10

Note: *SD* = standard deviation, CP = Pain group, D = Diabetes group, HC = healthy control group.

Table 1. Means, standard deviations and range of scores for pain (n = 15), diabetes (n = 15) and healthy control (n = 15) groups.

The IAT D Effect data did not meet the assumptions required to perform parametric analysis ($L(2, 42) = 4.170, p = .022$). Therefore to investigate whether individuals with chronic illnesses had a less positive implicit self-esteem bias, the IAT-D effect was analysed using a Kruskall-Wallis test. There was a significant difference between the groups on the IAT-D effect (Kruskal-Wallis $\chi^2 = 9.268$, $df = 2$, $p = .010$). Follow-up tests illustrated a significant difference between the pain and control groups ($U = 34.0, p = .001$), but not between the pain and diabetes groups (U

= 82.0, *p* = .217) or between the diabetes and control groups (*U* = 81.0, *p* = .202). This difference is illustrated in Figure 1.

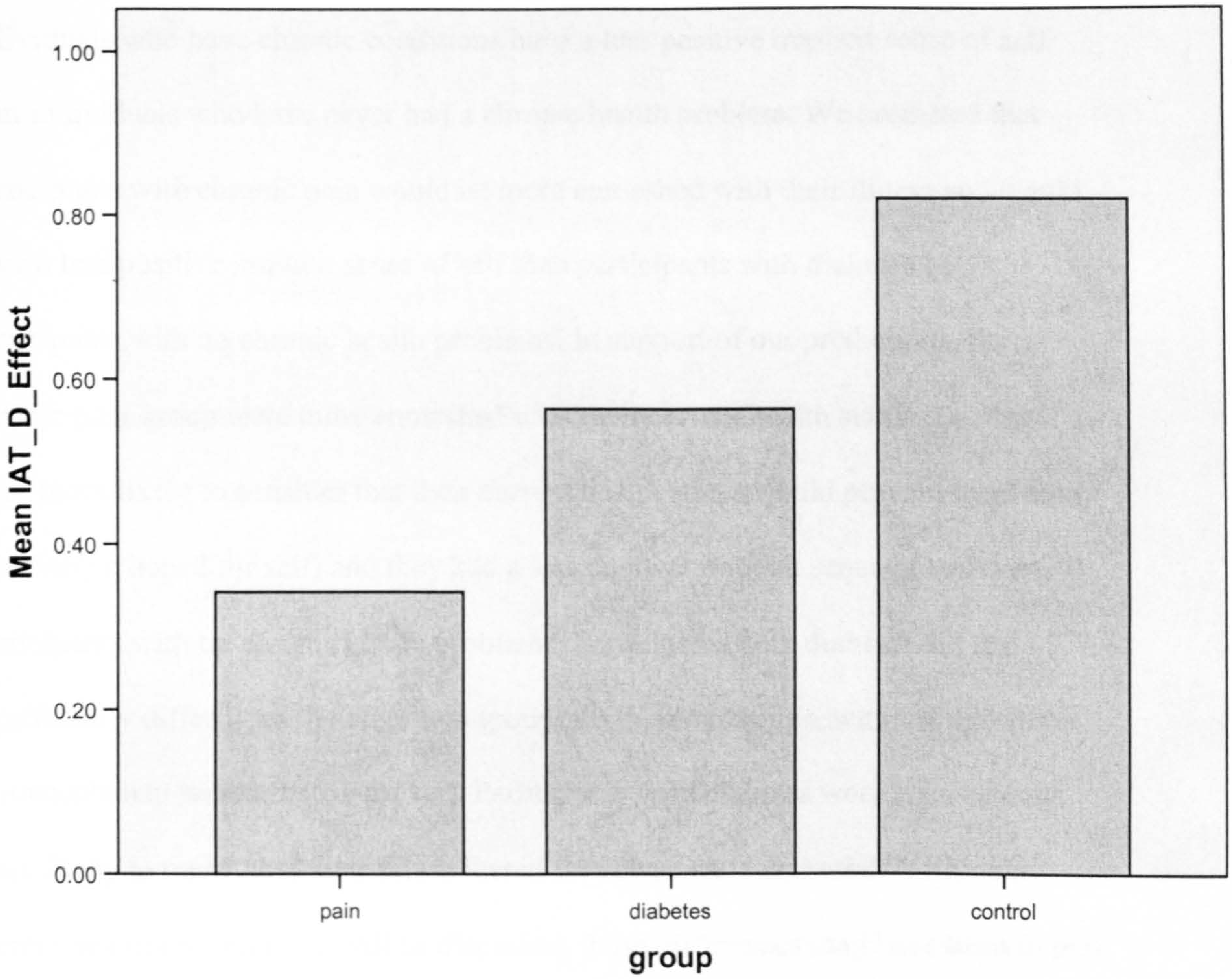

Figure 1. Bar chart of IAT D Effect Scores for pain (*n* = 15), diabetes (*n* = 15) and healthy control (*n* = 15) groups.

A significant correlation was found between WHO-QOL scores and IAT D Effect scores (Spearmans Rho *r* = .361, *p* = .015), and WHO-QOL scores and hoped-for self enmeshment (Spearmans Rho *r* = -.448, *p* = .002), however the correlation between WHO-QOL scores and feared-for self enmeshment was not significant (Spearmans Rho *r* = -.041, *p* = .791).

Discussion

This study had two aims. One, to investigate whether self-illness enmeshment is unique to chronic pain using explicit measures of self. Two, to see whether individuals who have chronic conditions have a less positive implicit sense of self than individuals who have never had a chronic health problem. We predicted that participants with chronic pain would be more enmeshed with their illness and would have a less positive implicit sense of self than participants with diabetes or participants with no chronic health problems. In support of our predictions, the chronic pain group were more enmeshed with their current health status (i.e. they were more likely to consider that their current health status would prevent them from achieving a hoped for self) and they had a less positive implicit sense of self than participants with no chronic health problems. Participants with diabetes did not significantly differ from the other two groups on these measures, with the exception of enmeshment with a feared-for self. Participants with diabetes were significantly more likely to report that their future feared for selves were enmeshed with their current health concerns. As will be discussed, these differences may have been in part attributable to age differences between the groups. For example, the diabetic group consisting of older, retired people may well have had a different hoped for self than the younger pain group.

These findings appear to fit well with current theories and previous research in the field of enmeshment. Self-regulatory theory (Carver & Scheier, 1998) predicts that a person's negative affect is directly related to the rate at which the distance between his or her ideal and actual self is changing. If the individual perceives that the route to the ideal self is blocked, depression and frustration ensues (Morley et al., 2005). The finding that those participants with chronic pain in this study were more enmeshed with their current health status than those without a chronic health condition supports this theory and is consistent with previous research, which has reported that people with chronic pain report themselves as entrapped by their pain (Hellstrom, 2001; Hellstrom & Jansson, 2001; Morley et al., 2005).

In general chronic pain appears to restrict daily functioning more than diabetes. Therefore we hypothesised that, if the self-regulatory theory (Carver & Scheier, 1998) is applied to experiences of chronic conditions, those with chronic pain would experience greater discrepancy between ideal and actual self than those with diabetes. In support of this prediction, participants with diabetes reported a significantly better quality life than participants with chronic pain, which indicates that their condition was less likely to impact upon their day-to-day functioning. Also, unlike those with chronic pain, participants with diabetes were not significantly more enmeshed with their health than the control participants when considering a hoped-for self. Additionally we found a negative association between quality of life scores and illness-enmeshment; poorer quality of life was related to higher illness enmeshment. Therefore it appears that the interference in quality of life caused by chronic pain may be instrumental in blocking routes to an ideal (hoped for) self.

Self-discrepancy theory (Higgins, 1987) proposes that the discrepancy between an individual's 'ideal' and 'actual' self will be associated with their level of depression. Power & Dalgleish (1998) define fear (associated with anxiety) as 'physical or social threat to self or valued role or goal' and sadness (associated with depression) as 'loss or failure of valued role or goal'. The crucial distinction appears to be between *loss* and *threat*. Since illness enmeshment is associated with the blocking of goals, rather than a threat to the goals being blocked, according to these definitions it makes intuitive sense that the overriding emotion experienced will be one of depression rather than anxiety. Self-discrepancy theory is supported by work done by Morley et al. (2005), who found that the proportion of hoped-for (rather than feared-for) self characteristics that could be achieved even with the presence of pain predicted depression scores. We also found that the chronic pain group in this study (who reported greater enmeshment) had significantly higher depression, but not anxiety scores, than the diabetes or control groups. These results should however be approached with some caution since a number of the somatic components of depression (e.g. slowing, tiredness, as measured by specific items on the HADS) also overlap with those experienced by individuals as a direct consequence of their chronic pain.

Additionally, like Morley and colleagues (2005) we found that illness enmeshment associated with hoped-for self, but not feared for self, in chronic pain groups. However, amongst diabetic participants, illness-enmeshment associated with feared-for self, but not hoped-for self was reported. This raises a number of questions. Firstly was this response an artefact of methodological bias; and secondly, given that it may be valid, what conclusions could we draw. It has been argued that the act of generating personal descriptors might be influenced by a third variable, e.g. reading ability or mood, which in turn may make this method susceptible to bias (Morley et al., 2005). However, there was no difference in reading ages between the groups in the study and even in the chronic pain group (who reported higher levels of depression) every participant was able to identify a number of positive hoped-for self descriptors. Given therefore, that there seems little evidence of bias in the generation of descriptors, why might our chronic pain sample report that their hoped-for selves were enmeshed with current health concerns, whereas the diabetic sample report an enmeshment with the feared-for self? We propose two potential post-hoc interpretations, which are not necessarily mutually exclusive. The first is that feared-for and hoped-for selves are distinctly different facets of the self which operate in different ways, and may be independently challenged. The second focuses on the impact of the age of the participants in the groups.

The differing responses to hoped-for and feared-for selves in both this and Morley's study suggest that a challenge to a hoped for self may be conceptually different to avoiding a feared for self. According to Higgins (1987) the former involves an inhibition of movement towards the positive (a hoped for self), whereas the latter involves an inability to inhibit movement towards the negative (a feared for self). This conceptualisation of a hoped for self as an inhibition of a positive self (rather than facilitation of a negative self) fits conceptually with the reduction in implicit sense of self displayed by the chronic pain group in our IAT results and the association we found between QOL scores and implicit positive self esteem. However, it does not explain why the diabetes group reported an enmeshment in relation to the feared-for self. One explanation of this difference may relate to the differing ages of the groups. The members of the diabetes group were significantly older than the other participants in the study. In fact, most of the diabetes participants were approaching or had met retirement age; and therefore, they were more likely to be facing declines in health associated with old age. These age-related declines in health may have impacted upon participants' perceptions of their ability to avoid movement towards a feared for self. They may also have lessened illness-enmeshment in terms of a hoped for self – in particular, older participants in the diabetes group may have fewer aspirations yet to be met than the younger pain and control groups and therefore may be less likely to experience depression due to blocking of aspirations for a hoped for self. Additionally, there may be cohort effects due to the older age of this group –

participants in the diabetes group were more likely to have grown up in the 1940s and 1950s when the country was recovering from the impact of the Second World War and therefore may be more practised in adjusting to challenges to quality of life.

Further research on the impact of age, and the interaction between age and health, on sense of self, would be useful to systematically investigate this issue.

Self-regulatory and self-discrepancy theories look at aspects of the self that are available to conscious introspection. In this study we also considered implicit views of the self. Our results, which showed that individuals with chronic pain have a less positive implicit sense of self than participants with diabetes or with no chronic health problems, are consistent with De Jong's (2002) and Franck, De Raedt and De Houwer's (2007) findings that individuals with emotional disorders do not show a negative self bias, but instead lack the positive self bias that is demonstrated by non-anxious or non-depressed controls. Given the higher levels of depression in the chronic pain sample, our findings of implicit positive self-esteem are therefore unsurprising. Tanner, Stopa and De Houwer (2006) suggest that there may be advantages to a system that is biased towards making rapid, automatic, positive inferences and assumptions particularly in situations where individuals feel challenged (e.g. by a chronic illness). As mentioned earlier in our discussion of enmeshment with a hoped for self, the absence of a positive bias may therefore act as a maintaining factor in the experience of entrapment.

In order to consider the implications of these findings, however, it is important to address the potential that these findings may be methodological artefacts. Debates remain over what the IAT is measuring (De Houwer, 2002) we will also address how it is measured and who is sampled.

The IAT measures associations between the self *relative* to others; however, the authors of the method argue that the development of the self is dependent on interactions with others (Greenwald & Farnham, 2000). It has also been argued that the IAT reflects societal rather than personal views of the self (Olson & Fazio, 2004), therefore positive implicit responses may reflect a society's view of the self as positive, even in those who have negative personal views of themselves (Tanner et al., 2006). This may explain evidence that shows a reduced implicit positive (rather than negative) self esteem in IAT studies of emotional disorders (as cited earlier in this discussion) and also our results with participants with chronic illness.

Evidence has also been found which indicates that the choice of words used in IAT measures can influence results (see De Houwer, 2001; 2002; Steffens & Plewe, 2001). In the present study, the words that were used represented global self-evaluations and may have provided over-simplistic representations of the self. However, the stimuli were identical to those used in a study by Greenwald and Farnham (2000) to measure self-esteem and self-concept and therefore were deemed a reliable comparison to standard IAT studies. A novel aspect of this study was the comparison across chronic illness groups. There was some heterogeneity within the chronic illness groups in terms of length of illness experienced, and between the groups in relation to their experience of diagnosis and length of time to diagnosis. However, crucially, given the between-group comparisons, there was no significant difference in gender or length of time living with the illness between the chronic illness groups. Also the mix of participants with chronic illness used in this study is consistent with the enmeshment model which seeks to understand the experience of chronic illness per se rather than specific categories (Morley et al., 2005).

If the presence of significantly higher levels of enmeshment and less positive implicit self esteem in chronic pain groups, compared to diabetes and control groups, cannot simply be dismissed on methodological grounds, then how can we explain it? It is possible that the nature of the illness experienced may be important in terms of the impact on the self. In this study, the chronic pain group reported higher levels of depression and lower quality of life; however they also had longer time spans between their first experience of the chronic pain symptoms and diagnosis of chronic pain. It may be interesting in future studies to consider the variance in enmeshment and implicit self esteem accounted for by these factors in order to investigate whether there is something unique to chronic pain that makes it more likely to reduced an individual's positive implicit sense of self (e.g. decreased quality of life, increased depression, increased time to diagnosis) and increase illness-enmeshment than other chronic conditions. The extent to which the findings apply within different diagnostic groups with chronic pain is unknown and awaits empirical exploration as does the replication and extension of these results with participants who have a range of chronic conditions. It would be interesting to compare age-matched participants with chronic pain with participants with chronic illnesses that also result in low levels of quality of life on these measures. Whether high levels of enmeshment represent a risk factor for depression, or conversely, whether low levels of enmeshment act to buffer the individual from depression cannot be distinguished by the present study design and will be an important question for future research to address.

In conclusion, the results of this study support and extend previous work by indicating that chronic pain had an impact on both the implicit and explicit self, yet this was not the result of chronic conditions per se, since these differences were not consistently evidenced in the diabetes group. This preliminary finding highlights the importance of considering the impact of chronic pain, and other chronic conditions, on both the explicit and implicit sense of self, to aid understanding of the varying impact of specific chronic health conditions on the self.

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Appendix A: Possible Selves interview script (amended for those with no chronic illness) based on a script presented by Morley, Davies & Barton (2005).

Part 1. Actual self

"This part of the study is concerned with how you view yourself at the moment. Please list up to 10 characteristics that you think you actually possess. You can include things you don't like about yourself as well as things you do like."

Part 2. Hoped-for self

"This section is concerned with how you see yourself in the future. Sometimes we think about what we hope we will be like in the future. Examples of this may be becoming a parent, a homeowner or grandparent. Please take a little time to think about all of your hoped for selves – you may have just a few or many. Now list the characteristics you hope you will possess in the future. Some of these may be characteristics you already possess.

When you have this list, for each characteristic please decide if you could be like this in the future if you remained *at the same level of health* as you are now. Circle 'Yes' or 'No' alongside each word.

Next, think 'Can I make this description come true?' How capable do you feel of achieving this description in the future? Please rate on a 7 point scale, where 1 means that you don't believe you're capable of making it happen and 7 means that you believe that you are definitely capable of making it happen.

Finally consider, 'How likely is it that these characteristics will describe me in the future? Again rate on a 7-point scale where 1 = very unlikely, 7 = very likely."

Part 3. Feared-for self

"In addition to having hoped for possible selves, we may have images of ourselves that we fear, dread, or don't want to happen. Examples of common feared for selves are getting divorced or having financial problems. Some of us may have a large number of feared possible selves in mind, whereas others may have only a few. Please take a little time to think about all of your feared possible selves. List as many as you can think of. Now list the characteristics of the person you fear becoming.

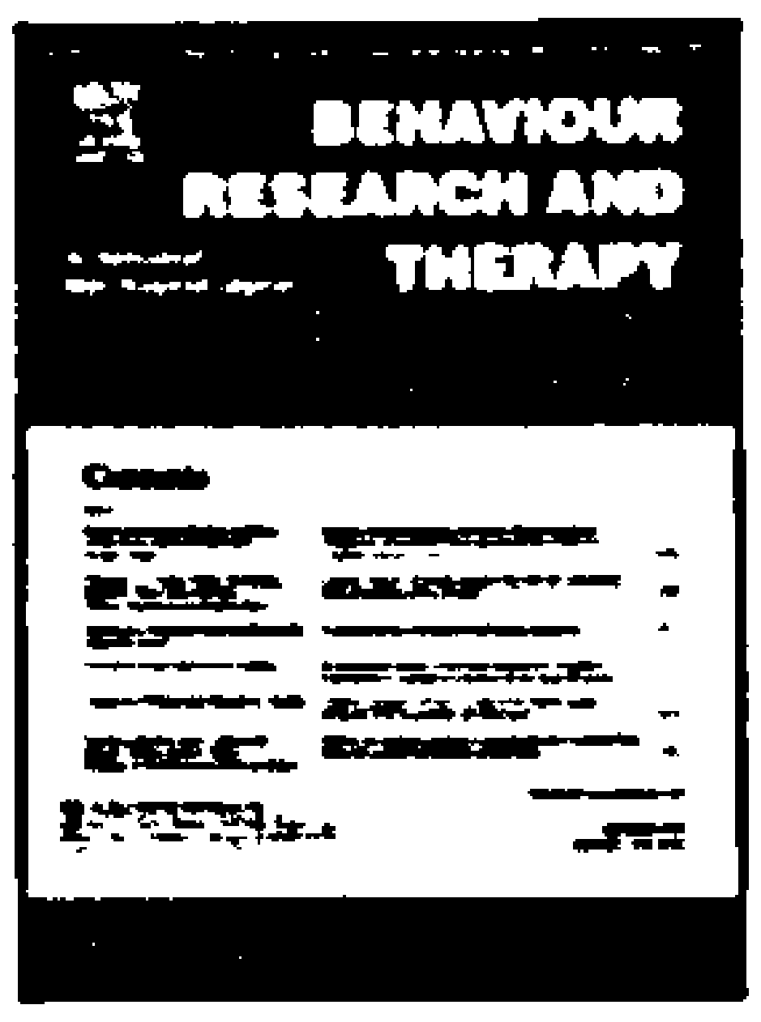
When you have your list of characteristics, for each one please decide if you could be like that if you remained *at the same level of health* as you are now. Circle 'Yes' or 'No' alongside each word.

Next think 'Can I stop this description becoming true?' How capable do you feel of preventing this description in the future? Please rate on a 7-point scale, where 1 means that you don't believe you're capable of stopping it happen and 7 means that you believe that you're definitely capable of stopping it happen.

Finally consider, 'How likely is it that these characteristics will describe me in the future? Again please rate on a 7-point scale where 1 = very unlikely, 7 = very likely."

Appendix B: Guidelines for submission to '*Behavioural Research and Therapy*'

ELSEVIER



BEHAVIOUR RESEARCH AND THERAPY

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Behaviour Research and Therapy encompasses all of what is commonly referred to as cognitive behaviour therapy (CBT). The major focus is on the following: experimental analyses of psychopathological processes linked to prevention and treatment; the development and evaluation of empirically-supported interventions; predictors, moderators and mechanisms of behaviour change; and dissemination of evidence-based treatments to general clinical practice. In addition to traditional clinical disorders, the scope of the journal also includes behavioural medicine. The journal will not consider manuscripts dealing primarily with measurement, psychometric analyses, and personality assessment.

Presentation of manuscript Please write your text in good English (American or British usage is accepted, but not a mixture of these). Italics are not to be used for expressions of Latin origin, for example, in vivo, et al., per se. Use decimal points (not commas); use a space for thousands (10 000 and above). Print the entire manuscript on one side of the paper only, using double spacing and wide (3 cm) margins. (Avoid full justification, i.e., do not use a constant right-hand margin.) Ensure that each new paragraph is clearly indicated. Present tables and figure legends on separate pages at the end of the manuscript. If possible, consult a recent issue of the journal to become familiar with layout and conventions. Number all pages consecutively.

Provide the following data on the title page (in the order given).
Title. Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
Author names and affiliations. Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors' *affiliation* addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name, and, if available, the e-mail address of each author.
Corresponding author. Clearly indicate who is willing to handle correspondence at all stages of refereeing and publication, also post-publication.
Present/permanent address. If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Abstract. A concise and factual abstract is required (maximum length 200 words). The abstract should state briefly the purpose of the research, the principal results and major

conclusions. An abstract is often presented separate from the article, so it must be able to stand alone. References should therefore be avoided, but if essential, they must be cited in full, without reference to the reference list.
Keywords. Immediately after the abstract, provide a maximum of 6 keywords, to be chosen from the APA list of index descriptors. These keywords will be used for indexing purposes.
Abbreviations. Define abbreviations that are not standard in this field at their first occurrence in the article: in the abstract but also in the main text after it. Ensure consistency of abbreviations throughout the article.
N.B. Acknowledgements. Collate acknowledgements in a separate section at the end of the article and do **not**, therefore, include them on the title page, as a footnote to the title or otherwise.

Arrangement of the article
Appendices. If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: (Eq. A.1), (Eq. A.2), etc.; in a subsequent appendix, (Eq. B.1) and so forth.
Acknowledgements. Place acknowledgements, including information on grants received, before the references, in a separate section, and not as a footnote on the title page.
Figure legends, tables, figures, schemes. Present these, in this order, at the end of the article. They are described in more detail below. High-resolution graphics files must always be provided separate from the main text file (see Preparation of illustrations).
Specific remarks
Tables. Number tables consecutively in accordance with their appearance in the text. Place footnotes to tables below the table body and indicate them with superscript lowercase letters. Avoid vertical rules. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article.

References Responsibility for the accuracy of bibliographic citations lies entirely with the authors
Citations in the text: Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications should not be in the reference list, but may be mentioned in the text. Citation of a reference as 'in press' implies that the item has been accepted for publication.
Citing and listing of web references. As a minimum, the full URL should be given. Any further information, if known (author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.
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List: References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication.

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Reference to a book: Strunk, W., Jr., & White, E. B. (1979). The elements of style. (3rd ed.). New York: Macmillan, (Chapter 4).
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