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The effect of implicit theories of pain on pain and disability in people with chronic low back pain

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ABSTRACT

Background: Implicit theories of pain represent a socio-cognitive mechanism linked to important coping, emotional, and expressive reactions to chronic pain. Evidence suggests that chronic low back pain (CLBP) patients who hold an incremental theory of pain (i.e., view pain as a malleable) use more active coping strategies, display less pain behavior, and report lower levels of depression than those with an entity theory of pain (i.e., view pain as a fixed). However, a link between implicit theories of pain and symptoms of pain and disability in people with CLBP has not been established.

Objectives: This study investigated the relationship between implicit theories of pain and the level of pain and disability reported by people with CLBP.

Design: Cross-sectional observational study.

Methods: One hundred and two participants with CLBP completed an online survey distributed through social media channels. The online survey assessed pain intensity and pain-related disability (Chronic Pain Grade Scale), implicit theories of pain (Implicit Theory of Pain Scale), and perceived control over pain (Survey of Pain Attitudes control scale).

Results: Participants with an incremental theory of pain reported significantly less pain and disability compared to those with an entity theory of pain ($p < 0.001$).

Conclusions: These findings suggest that implicit theories of pain may guide self-reported symptoms of pain and disability in a CLBP population. Prospective studies are required to confirm the relevance of these findings for risk of future low back pain, and to confirm whether this relationship changes with and without treatment.

1. Introduction

Chronic low back pain (CLBP) is the most common form of chronic musculoskeletal pain and one of the most disabling health disorders in the Western world (Begg et al., 2008). Although the prevalence of CLBP continues to rise (Freburger et al., 2009), determining efficacious treatment remains elusive. However, there is growing evidence that a person's coping strategies, the behavioural and cognitive attempts to manage pain and the impact of pain on one's life, underpins the persistence of low back pain (DiNapoli et al., 2016; Koleck et al., 2006; Kraaijaat and Evers, 2003; Pincus et al., 2002). For example, patients with chronic pain who adopt passive coping strategies (e.g., withdrawal, resting, worrying–catastrophising) report poorer outcomes, such as decreased physical functioning and increased psychological distress, whereas those who use active coping strategies (e.g.,

continuing activities despite pain) report less disability and distress (DiNapoli et al., 2016; Alschuler et al., 2013; Wertli et al., 2014a, 2014b). In addition, there is a three-fold increase in the risk of developing CLBP in individuals who report high levels of passive coping at the time of a new episode of low back pain, with no associated risk of developing CLBP for those who report high levels of active coping (Koleck et al., 2006; Jones et al., 2006).

A theoretical approach that may explain differences in pain coping in people with CLBP is implicit theories in the field of social cognition (Dweck et al., 1995; Dweck and Leggett, 1988; Hong et al., 1999; Molden and Dweck, 2006). First described by Dweck and colleagues, implicit theories refer to the different assumptions people have about the malleability of personal attributes (Dweck et al., 1995; Dweck, 2007, 2013). One personal attribute, intelligence, has been investigated in a number of populations (Dweck et al., 1995; Blackwell et al., 2007;

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Dupeyrat and Mariné, 2005). People who hold an “entity theory” of intelligence believe that their intelligence is fixed or unchangeable, and that while people may learn new things, their underlying intelligence remains the same. In contrast, people who hold an “incremental theory” of intelligence believe their intelligence is malleable and can be changed/improved through effort (Dweck et al., 1995). Implicit theories have important emotional and motivational consequences when a person experiences setbacks/failure (Dweck et al., 1995; Hong et al., 1999; Molden and Dweck, 2006; De Castella and Byrne, 2015). With a setback or failure, an incremental theory leads to attributions related to effort or strategy, which leads to emotions and behaviours aimed at remediation of the failure, whereas an entity theory leads to attributions of ability, which in turn lead to emotions and behaviours that reflect giving up (Molden and Dweck, 2006; Weiner, 2014).

The relationship between a person's implicit theories and chronic pain has been investigated recently. Like intelligence, chronic pain has been regarded an internal and long-lasting self-attribute that when considered in the context of implicit theories has important emotional and motivational consequences (Higgins et al., 2015). For example, individuals who hold an entity theory of pain may believe their pain is fixed, unchangeable and could orient them towards withdrawing effort and adopting passive coping strategies. In contrast, the belief that pain is changeable may endorse an incremental theory that could promote active strategies towards remediation of the pain. Indeed, a study in 2015 used the Control scale of the Survey of Pain Attitudes (SOPA) to measure implicit theories of pain in a CLBP population and reported that, compared to patients with an incremental theory of pain, patients with an entity theory of pain used fewer active coping strategies, felt more depressed, catastrophised more, and demonstrated more facial grimacing in response to a painful physiotherapy procedure (Higgins et al., 2015). While this study provides valuable information to aid the assessment and treatment of chronic pain, a link between implicit theories of pain and symptoms of pain and disability was not established. Thus, the primary aim of the present study was to determine if implicit theories of pain are related to the level of pain and disability reported by people with CLBP. It was hypothesised that individuals with an entity theory of pain would report greater pain and disability than those with an incremental theory of pain. A secondary aim was to examine whether the Implicit Theories of Pain Scale developed for this study (ITPS; see Appendix) correlated with the Control scale of the SOPA (Jensen et al., 1994). Because the Control scale of the SOPA measures control beliefs about pain, and since control and changeability (i.e. fixed/malleable) are related constructs, scores on the ITPS and SOPA Control scale should be correlated and would provide converging evidence with previous work (Higgins et al., 2015) and highlight the importance of implicit theories of pain in people with CLBP.

2. Methods

2.1. Study design and participants

A cross sectional, online survey of individuals experiencing CLBP was conducted. The survey was administered using the program Qualtrics (Qualtrics, Provo, UT) and distributed through social media sites internationally, including Facebook and Twitter. The survey targeted support groups for people with CLBP. The institutional Human Research Ethics Committee approved the study (H10184).

2.2. Questionnaire content

2.2.1. Classifying individuals with CLBP

The first page of the questionnaire invited individuals currently experiencing low back pain to complete the survey. An illustration was used to guide respondents to what was meant by the term ‘low back pain’ (Fig. 1A). A series of questions asked respondents about the duration of current pain and if applicable, about prior episodes of low

back pain. Individuals were classified as CLBP if their current episode of pain had lasted longer than a three-month period (Qaseem et al., 2017). If individuals reported a previous episode of low back pain lasting at least 24 h and that followed a period of at least 30 days pain-free, they were classified as recurrent low back pain (Stanton et al., 2011). If individuals had experienced their current episode of pain for less than a three-month period, they were classified as acute low back (Chou et al., 2003). The questionnaire also collected demographic details of the sample including age and gender. As stated in the instructions to potential participants, completion of the survey implied consent.

2.2.2. Chronic pain grade scale

The Chronic Pain Grade Scale (CPGS) was used to assess pain intensity and pain related disability (Manraj and Saurabh, 2013; Smith et al., 1997; Von Korff et al., 1992). The CPGS evaluates the severity of chronic pain and its impact on activities using seven items; six items are answered on 11-point Likert-type scales and one item asks how many days were lost in the past six months due to pain. The pain intensity score (three items) is determined by the mean of pain intensities reported for current pain status, as well as the worst and average pain in last six months. The pain disability score (three items) is based on the mean ratings of how much the pain has interfered in performing activities of daily living, work, and social activities in the last six months. The CPGS has demonstrated validity and reliability and is suitable for a range of chronic pain conditions including CLBP (Smith et al., 1997; Penny et al., 1999).

2.2.3. Implicit theories of pain scale

The Implicit Theories of Pain Scale (ITPS) was adapted for the present study from the Implicit Theories of Intelligence Questionnaire (Dweck, 2013). The Implicit Theories of Intelligence Questionnaire measures the extent to which intelligence is perceived as a malleable trait (Dweck, 2013). Replacing the word ‘intelligence’ with ‘pain’, the ITPS (see Appendix) included eight items answered on a six-point Likert-type scale of 1 (Strongly Agree) to 6 (Strongly Disagree) that assessed an individuals' beliefs about whether their pain is fixed or malleable. This “find-and-replace” method has been used to create new implicit theory measures of self-attributes (Burnette, 2010; Chiu et al., 1997; Schroder et al., 2015; Valentin et al., 2011), and given that chronic pain is considered an internal self-attribute (Higgins et al., 2015), the inclusion of the term ‘pain’, instead of ‘intelligence’, provides a questionnaire that uniformly address the fixed versus malleable nature of an individual's pain. Items from the Implicit Theories of Intelligence Questionnaire are well validated and previous studies have reported acceptable psychometric properties including internal consistency, and test-retest reliability (Dweck et al., 1995; Hong et al., 1999).

2.2.4. Control scale of the survey of pain attitudes

The Control scale of the Survey of Pain Attitudes (SOPA; (Higgins et al., 2015)) was used to measure the extent to which a person believes that pain is under their control. The SOPA Control scale consists of 10 items answered on scales of 0 (very untrue for me) – 4 (very true for me). The Control score is calculated as the mean of items and thus ranges from 0 to 4, with higher scores indicating that the person believes that they can control their pain. The SOPA Control scale has demonstrated very good internal consistency, test-retest reliability, and construct validity (Higgins et al., 2015; Jensen et al., 1994; Tait and Chibnall, 1997).

2.2.5. Data analysis

All data analyses were performed using Statistical Package for the Social Sciences (SPSS version 24) software (SPSS Inc., Chicago, IL, USA). Cronbach's alpha was calculated for each scale (CPGS, ITPS, SOPA) to assess internal consistency. Chi-squared tests were used to determine if there were differences in age or gender between

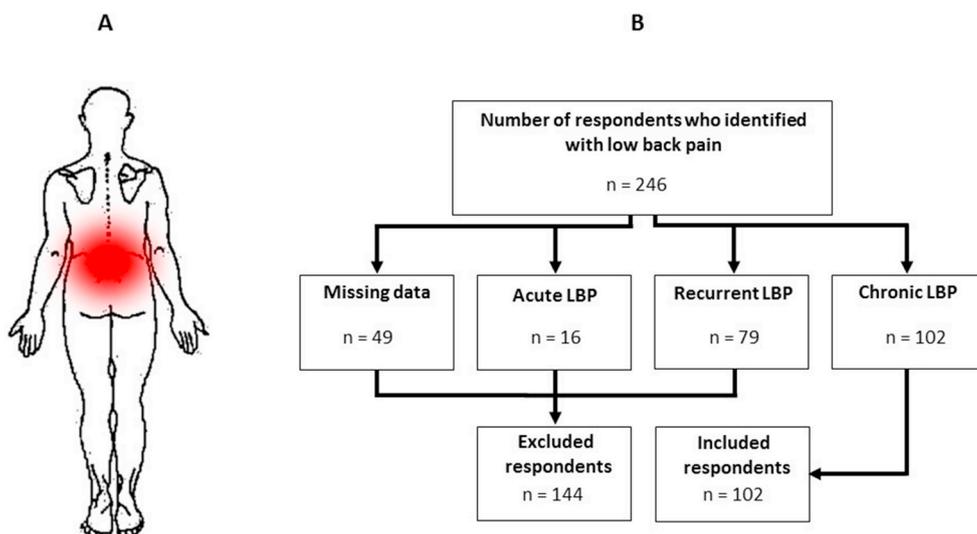


Fig. 1. Illustration of low back pain used in the on-line survey (A); participants were invited to take part in the survey if they experienced back pain in the region shaded red. Flow chart depicting the inclusion and exclusion of respondents (B); participants were excluded if they did not answer one or more questions in the survey (missing data) and presented with acute or recurrent low back pain (LBP). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

incremental versus entity theorists. A one-way multivariate analysis of variance (MANOVA) with independent groups (entity and incremental) and dependent variables (CPGS pain and disability) was performed to assess whether implicit theories of pain were a predictor of pain and disability. Pearson correlations were used to assess the relationship between the ITPS and SOPA Control Scale, and the relationship between these scales to pain and disability scores. To examine the comparability of the ITPS and SOPA Control scale as predictors of pain and disability, separate linear regression analyses were conducted (pain and disability as dependent variables and ITPS and SOPA scores as predictor variables). All data met assumptions of normality and homogeneity of variance as determined by the Shapiro-Wilk test and Levene's test, respectively. Significance was set at $p < 0.05$ for all statistical analyses.

3. Results

3.1. Participant characteristics

Two hundred and forty-six participants took part in the survey. Of the 246 participants, a total of 144 individuals were excluded from the final sample and data from the remaining 102 participants with CLBP were used in subsequent analyses (Fig. 1B). The demographic data for the 102 respondents are presented in Table 1. The majority of respondents were female (72%). The age range (in years) varied, but most respondents were between the ages of 25–54 years. All respondents experienced low back pain for longer than three months, with over half of the sample reporting pain for greater than five years.

3.1.1. Internal consistency of questionnaires

All questionnaires used in the present study demonstrated a high

Table 1
Demographic details of respondents.

Variable	Category	Sample (n = 102)
Gender, n (%)	Male	29 (28)
	Female	73 (72)
Age, n (%)	18–24 years	12 (12)
	25–34 years	28 (27)
	35–44 years	23 (23)
	45–54 years	24 (24)
	55–64 years	9 (9)
	65–74 years	6 (5)
Pain duration, n (%)	3 months–12 months	13 (13)
	1–5 years	31 (30)
	> 5 years	58 (57)

level of internal consistency, ranging from an alpha of 0.73–0.90 (Tavakol and Dennick, 2011). Specifically, the ITPS demonstrated an alpha of 0.90. The CPGS measures of pain intensity and disability demonstrated an alpha of 0.73 and 0.90, respectively, and the SOPA Control scale demonstrated an alpha of 0.88.

3.2. Classifying implicit theories of pain

Participants were classified as entity or incremental theorists using a median split criterion, such that participants were considered entity theorists if their ITPS score was 3.5 or below ($n = 47$) and incremental theorists if their score was 3.75 or above ($n = 47$). Classifying implicit theories this way is consistent with previous research and ensures that only individuals with clear implicit theories are included (Burns and Isbell, 2007; Butler, 2000; Romero et al., 2014). With this approach, a small number of participants who scored at the median are excluded as they are considered mixed in their beliefs and thus indeterminate, with the remainder of participants evenly distributed between two implicit theory groups (Dweck et al., 1995). In the present study, eight participants who scored at the median (3.63) were excluded from the analyses, leaving a final sample of 94 participants for examining the effects of implicit theory of pain on reported pain intensity and disability. Chi-square tests revealed no difference in either age ($X^2 (5, N = 94) = 6.065, p = 0.300$) or gender ($X^2 (1, N = 94) = 0.213, p = 0.645$) between the participants who held an incremental or an entity theory of pain. Means and standard deviations for all variables (overall and for each implicit theory of pain group) are reported in Table 2.

3.3. Implicit theory of pain as a predictor of self-reported pain and disability

A one-way MANOVA of CPGS pain intensity and disability scores, with ITPS score as the grouping factor (Entity Theory vs. Incremental Theory) revealed that implicit theory of pain was a significant predictor of pain intensity and disability scores ($F(2, 91) = 10.82, p < 0.001$, partial $\eta^2 = .192$). The univariate analysis of pain intensity scores revealed a main effect for implicit theory of pain ($F(1, 92) = 14.55, p < 0.001$, partial $\eta^2 = .137, CI = [5.84; 18.53]$), indicating that entity theorists reported greater pain intensity ($M = 64.19, SD = 14.95$) than incremental theorists ($M = 52.00, SD = 16.02$). Similarly, the univariate analysis of disability scores revealed a main effect for implicit theory of pain ($F(1, 92) = 19.35, p < 0.001$, partial $\eta^2 = .174, CI = [11.81; 31.25]$), indicating that entity theorists reported greater disability ($M = 57.93, SD = 25.98$) than incremental theorists ($M = 36.40, SD = 21.22$).

Table 2

Means and standard deviations (SD) of measured variables in the overall sample and in the Entity and Incremental Theory of Pain groups.

Measure	Overall (n = 102)		ITPS Entity Theory of Pain Group		ITPS Incremental Theory of Pain Group	
	Mean	SD	Mean	SD	Mean	SD
Implicit Theory of Pain (ITPS)	3.54	0.902	2.78	0.551	4.30	0.548
SOPA Control	1.98	0.781	1.38	0.583	2.56	0.519
CPGS Pain Intensity	57.56	16.94	64.19	14.94	52.00	16.01
CPGS Disability	47.54	25.85	57.93	25.97	36.40	21.22

Note: ITPS Entity Theory of Pain Group (n = 47). ITPS Incremental Theory of Pain Group (n = 47). Scoring of CPGS Pain Intensity and Disability measures involves calculating a mean of three items (on 11 point scales) and a multiplier of 10 for each measure.

Table 3

Correlations between measured variables.

Measure	Implicit Theory of Pain	SOPA Control	CPGS Pain Intensity	CPGS Disability
Implicit Theory of Pain (ITPS)	1.00			
SOPA Control	0.718**	1.00		
CPGS Pain Intensity	-0.388**	-0.373**	1.00	
CPGS Disability	-0.410**	-0.448**	0.642**	1.00

**p < 0.01 level (two-tailed). N = 102.

3.4. Comparison of the ITPS and the SOPA control scale

As shown in Table 3, the ITPS correlated strongly with the SOPA Control scale ($r = .718, p < 0.01$), suggesting that they are measuring similar phenomena. As expected, both the ITPS and SOPA Control scale were negatively correlated with the CPGS pain intensity and disability scales (Table 3). As shown in Table 4, both the ITPS and the SOPA Control scale were significant predictors of CPGS pain intensity and CPGS disability. As the beta weights in Table 4 demonstrate, with such sizeable and comparable predictive power over CPGS pain intensity and disability scores, it should be helpful to researchers to know that either scale may be of use in assessing implicit theories of pain and their effects in a CLBP population.

4. Discussion

This study provides unique insight into the relationship between implicit theories of pain and symptoms of pain and disability in a CLBP population. In the present study, people with CLBP who held an incremental theory of pain reported significantly lower pain intensity and disability compared to those with an entity theory of pain. For the first time, a link between implicit theories of pain and self-reported symptoms of pain intensity and disability has been established. This finding extends previous work demonstrating that compared to CLBP patients with an entity theory of pain, patients with an incremental theory of pain use more active coping strategies, display less pain behavior, and report lower levels of depression (Higgins et al., 2015). This finding, together with those from the present study, support the notion that implicit theories of pain represent a social-cognitive mechanism that underpins important coping, emotional, and expressive reactions to

chronic pain, as well as self-reported symptoms of pain and disability (Higgins et al., 2015). Thus, beliefs about the fixed or malleable nature of chronic pain may represent an important target for future treatments in low back pain. Further, such beliefs may provide valuable information to clinicians when identifying which patients could be at risk at not engaging/adhering to rehabilitation programs.

The reason why incremental theorists reported less pain and disability compared to entity theorists in the present study is not known; however, differences in implicit beliefs associated with an incremental or entity theory are thought to shape the trajectory of coping with the challenges and setbacks of long-term pain and thus may have an impact on reported symptoms of pain and disability (Higgins et al., 2015). That is, incremental theorists tend to engage in more active strategies as they believe the pain is changeable, while fixed beliefs (entity theorists) about pain lead to passive mood states (e.g., helplessness and depression) and reduced efforts at strategies involving behavior change (Higgins et al., 2015). These differences in a CLBP population are consistent with findings of the role of implicit theories in the field of achievement motivation, which show that incremental theorists often increase effort to overcome unsatisfactory performance (Blackwell et al., 2007; Higgins and LaPointe, 2012). The present findings are also supported by research on pain beliefs whereby perceptions of low control over pain correlate with disability and increased pain intensity, as well as maladaptive coping, depression, and catastrophic appraisal (Costal et al., 2011; Haythornthwaite et al., 1998; Jensen et al., 2001; Palyo and Beck, 2005; Toomey et al., 1991; Vallerand et al., 2007).

The measure of implicit theories of pain in the present study correlated with the SOPA Control scale, providing converging evidence of the importance of implicit theories of pain in a CLBP population. Moreover, both measures were predictors of reported pain intensity and

Table 4

Comparison of the Implicit Theory of Pain Scale (ITPS) and the SOPA Control scale in predicting CPGS pain intensity and pain disability scores.

Dependent Variable	Source	B	SE B	β	t	p	95% CI	
							Lower	Upper
Pain Intensity	ITPS ^a	-7.29	1.730	-0.388	-4.216	< 0.001	-10.726	-3.862
	SOPA Control Scale	-8.098	2.012	-0.373	-4.026	< 0.001	-12.089	-4.107
Pain Disability	ITPS	-11.734	2.612	-0.410	-4.492	< 0.001	-16.917	-6.551
	SOPA Control Scale	-14.823	2.957	-0.448	-5.013	< 0.001	-20.690	-8.957

N = 102 for the analysis.

^a ITPS = Implicit Theory of Pain Scale. B (unstandardised coefficient), SE B (standard error of B), β (standardised coefficient).

disability in the present study. Thus, the data suggest that either measure could be used to assess implicit theories of pain in a CLBP population. Future work should endeavour to measure implicit theories of pain in other chronic pain populations to determine if the findings presented here extend beyond CLBP.

The present study provides a snap-shot in time of the relationship between implicit theories of pain and the pain and disability from CLBP, but does not address whether implicit theories of pain are a cause of the differences in self-reported pain intensity and disability. Further longitudinal studies using a cross-lagged panel design may help provide some evidence of a causal direction (Kenny, 1975). In addition, since implicit theories are beliefs and thus changeable, interventions aimed at belief change while tracking pain symptoms are likely to establish whether implicit theories are a causal factor in people's reactions to chronic pain. Indeed, this approach has been explored in the context of academic performance. For example, interventions targeting incremental beliefs about intelligence have demonstrated shifts in incremental theories that are associated with greater longer term academic performance (Dweck et al., 1995; Blackwell et al., 2007).

There is the possibility that the implicit theory held (incremental or entity) by an individual with CLBP is a consequence, rather than a cause, of the associated symptoms and coping strategies. Implicit theories are considered beliefs about the fixed and malleability of personal attributes, which can be influenced through experience and learning (Dweck et al., 1995; Blackwell et al., 2007). As such, implicit beliefs about chronic pain may be influenced by an individual's environment, their social support, and their success with treatment. One well documented phenomenon in the literature of achievement motivation is that when an individual encounters a setback, some respond in a mastery-oriented manner (characterised by focus on effort and strategies, along with problem-solving strategies), whereas others respond helplessly (characterised by negative self-judgments, and lack of effort and persistence) (Dweck and Leggett, 1988). Thus, one possibility is that a lack of social support combined with a journey of unsuccessful treatment may reinforce helpless response patterns and entity beliefs, rather than mastery-oriented response patterns and incremental beliefs. Although the sample in the present study was relatively homogenous (with all individuals experiencing low back pain for longer than three months), details regarding social support and treatment success were not collected and the interaction between these factors and implicit theories of pain requires further investigation. Understanding factors that impact the malleability of implicit theories of pain has relevance for future use of the ITPS in the treatment for chronic pain.

The results of this study should be considered in light of methodological limitations. While the on-line survey provided access to participants with a variety of CLBP complaints, the response rate, the potential for response bias, and the possibility for self-selection bias could not be evaluated. However, the data demonstrated a range of CPGS scores (between 30 and 93) suggesting that the sample was mixed in terms of disability and pain levels. Also, SOPA Control scores in the present sample ($M = 1.98$, $SD = .78$, $n = 102$) were comparable with those reported in previous work investigating implicit theories of pain in a CLBP population ($M = 2.04$, $SD = .81$, $n = 201$) (Higgins et al., 2015), indicating that the present online sample did not differ in this respect from a larger CLBP patient sample who completed questionnaires in-person in a laboratory setting. Another consideration is that, although the sample reported pain located in the area of the low back (as illustrated), the extent of other co-morbidities (e.g.

radiculopathy, neuropathic pain or wide spread pain in other areas) were not known. Nevertheless, given the exploratory nature of the present study, the CLBP sample used was appropriate to answer the research question. Further studies with larger samples are required to confirm the findings as well as determine whether implicit theories of pain are mediated by different chronic pain presentations. While online surveys are commonly used in low back pain research (Picavet et al., 2002; Summers et al., 2018; Williams et al., 2010), there is the possibility that how the questions were positioned/contextualised may have contributed to the correlational overlap between the two questionnaires (ITPS vs SOPA Control scale). However, since control and changeability (i.e. fixed/malleable) are related constructs (Higgins et al., 2015), this relationship may have occurred irrespective of contextual factors. Lastly, the present study used a newly developed questionnaire to assess implicit theories of pain. Because this study is the first to use the ITPS in pain sufferers, there is no basis to compare the implicit theory of pain scores to the population at large. However, like previously validated questionnaires that assess pain attitudes and beliefs in chronic pain populations (Duquette et al., 2005; Edwards et al., 1992; Jensen et al., 1987; Riley et al., 1988; Skevington, 1990; Williams et al., 1994), the ITPS may only be relevant for use in those who are experiencing pain (e.g. interpreting a statement like "You can learn to live with your pain, but you can't significantly change your pain level" may be irrelevant to the pain-free individual). Although detailed psychometric testing on the ITPS was not provided, the Implicit Theory of Intelligence Questionnaire has been successfully adapted previously (Cabello and Fernández-Berocal, 2015; Ziegler and Stoeger, 2010) and the ITPS in the present study demonstrated excellent internal consistency. Future work is required to test the validity and repeatability of the ITPS in CLBP and in other chronic pain conditions.

5. Conclusions

The present study is the first to demonstrate a link between implicit theories of pain and self-reported pain intensity and disability in a CLBP population. The data demonstrate that people with CLBP who hold an incremental theory of pain report lower pain intensity and disability than those with an entity theory of pain. The measure of implicit theories of pain developed for use in the present study strongly correlates with a measure of control beliefs about pain used in previous research and provides converging evidence of the importance of implicit theories of pain in a CLBP population. Prospective studies are required to confirm the relevance of these findings for risk of future low back pain, and to confirm whether this relationship changes with and without treatment.

Conflicts of interest

None declared.

Ethical approval

Western Sydney University Human Research Ethics Committee approved the study (H10184).

Funding

Not applicable.

Appendix A

Implicit Theory of Pain Scale (ITPS; adapted from [16]).

1 Strongly Agree	2 Agree	3 Mostly Agree	4 Mostly Disagree	5 Disagree	6 Strongly Disagree
Implicit Theory of Intelligence Questionnaire (Dweck, 2013)			Implicit Theory of Pain Scale (ITPS)		
You have a certain amount of intelligence, and you can't really do much to change it. Your intelligence is something about you that you can't change very much. No matter who you are, you can significantly change your intelligence level. ^a To be honest, you can't really change how intelligent you are. You can always substantially change how intelligent you are. ^a You can learn new things, but you can't really change your basic intelligence. No matter how much intelligence you have, you can always change it quite a bit. ^a You can change even your basic intelligence level considerably. ^a			You have a certain amount of pain, and you can't really do much to change it. Your pain is something about you that you can't change very much. No matter who you are, you can significantly change your pain level. ^a To be honest, you can't really change how much pain you have. You can always substantially change how much pain you have. ^a You can learn to live with your pain, but you can't significantly change your pain level. No matter how much pain you have, you can always change it quite a bit. ^a You can change your level of pain considerably. ^a		

^a Reverse-scored items.

Appendix B. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.msksp.2019.01.013>.

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