Acceptance and related processes in adjustment to chronic pain

Miles Thompson & Lance McCracken

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Miles Thompson DClinPsy. & Lance M. McCracken, Ph.D.

Bath Centre for Pain Services

Royal National Hospital for Rheumatic Diseases

Bath, UK

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Acceptance and Related Processes in Adjustment to Chronic Pain

Abstract

Chronic pain poses significant challenges in the lives of many people. At the root of many of these challenges are the behavior patterns pain naturally coordinates. For example, in some cases attempts to control, reduce, or cure pain through medication, medical procedures, or lifestyle changes can prove unsuccessful, and can dominate all other potential goals. The experience of chronic pain also includes other discouraging, painful, or unwanted psychological experiences, such as thoughts, feelings, and memories. Attempts to control or reduce some of these psychological experiences also can prove unsuccessful and even harmful, further reducing quality of life. This review highlights recent evidence for the utility of acceptance as an alternative when control-based methods are unsuccessful. It describes evidence from experimental, clinical, and treatment outcome studies. The review also notes how work in this area is drawing attention to the wider concept of '*psychological flexibility*,' an overarching process that includes other component processes, such as mindfulness, values, and the like.

Introduction

Chronic pain is often associated with significant inactivity, suffering, and disability. And when faced with these problems the most natural approach is to try to eliminate or reduce the pain in order to reduce its impacts. Unfortunately this is often not possible either by medications, procedures, rehabilitation, or even psychological methods. If treatments are not successful in achieving direct control of pain, another understandable

approach might be to try to reduce associated symptoms or experiences presumed to worsen the pain experience, such as thoughts of helplessness or catastrophe, feelings of fear or depression, or other experiences. Increasing evidence, however, suggests that attempts to control the frequency or form of these types of psychological experiences can be difficult and may actually result in paradoxical increases in their occurrence and in increased sensitivity to their impacts [1, 2].

It is against the backdrop of the failures and paradoxes of control over experience that we present recent evidence for the role of acceptance. Set apart from other more commonsense solutions to chronic pain the notion of acceptance is at once counterintuitive and yet pragmatic. If, for whatever reason, it proves impossible to cure pain or to control one's psychological experiences, maybe a useful alternative is to be willing to "have these experiences as they are," particularly if so doing allows for more successful functioning.

This review provides a timely update to a previous article entitled "Acceptance of Chronic Pain" published in this journal in 2006 [3]. Mirroring the structure of the original, this article will review recent progress in measuring acceptance, experimental studies of acceptance and pain, clinical studies of acceptance and patient functioning, and studies of treatment outcome. Importantly, this review will suggest that recent progress in this field relies on more than acceptance alone and that while acceptance is important it forms just one part of the wider concept of 'psychological flexibility.' This wider process is central to a treatment approach known as Acceptance and Commitment Therapy (ACT) that has been applied successfully to chronic pain [4, 5, 6].

Psychological approaches to pain and acceptance

The history of psychologically based treatments for chronic pain, like much of the rest of empirically supported clinical psychology, can be thought of as proceeding in a series of generations. The first generation, known as the operant behavioral approach framed pain and associated suffering as a matter of behavior under the influence of an individual's history and their current environment [7]. This way of conceptualizing pain allowed researchers and clinicians to successfully work with patients to manipulate aspects of their environment to make improvements to behavior. The second generation, known as the cognitive-behavioral approach, highlighted the importance of thoughts and beliefs. Within the cognitive-behavioral approach such well-known variables as coping, catastrophizing, and self efficacy became central to the work of many psychologists [8]. In recent years a new third generation of approaches has developed as an evolution from both previous generations. These new approaches generally follow what is referred to as a contextual framework. This means that psychological events are not identified as necessarily problematic by their form alone but by how they interact with other experiences and with behavior, and how they exert their influences on well-being and functioning. These approaches are primarily pragmatic and focused on enhancing patient functioning rather than reducing symptoms or controlling potentially uncontrollable aspects of private experience. The notion of acceptance is key to such approaches.

The spirit of the term acceptance can be misunderstood both generally and in relation to chronic pain. There is a risk that clinicians might over simplify what is meant by acceptance, reducing it down to whether a patient has come to terms with the possibility that “pain may not go away”. Rather than seeing acceptance as a one off agreement or disagreement with a medical opinion it can be more useful to think of it in terms of a

patient's willingness to continue to actively experience pain along with related thoughts and feelings. In this paper acceptance is conceptualized as a moment-to-moment, process, a continuing quality of action that allows individuals to move towards their goals or act on their values while contacting pain, difficult thoughts, feelings, and memories, and doing so without defense.

Measuring Acceptance

The most frequently used assessment measure of acceptance within chronic pain is the Chronic Pain Acceptance Questionnaire (CPAQ; [9]). Recent studies of the CPAQ have included both exploratory and confirmatory factor analyses on two large samples and provided further support for the 20-item, two factor version of this measure [10]. A systematic review of the psychometric properties of a number of pain acceptance questionnaires, published in 2009, found the CPAQ to have the best overall results and good evidence for internal consistency, construct validity and reliability [11]. The measure has also been translated into German [12] and Cantonese [13] and adapted for adolescent populations (CPAQ-A) [14]. Most recently a short form of the CPAQ consisting of just 8 items has undergone preliminary evaluation [15].

Experimental studies of acceptance and pain

Experimental work continues to examine different approaches to painful stimuli in laboratory settings and the influence of different sets of instructions related to acceptance of pain on exercise performance.

Recent laboratory based research investigated the influence of experiential avoidance, the opposite of acceptance, on acute pain tolerance and subsequent recovery [16]. Seventy healthy subjects completed a self report measure known as the 'Acceptance and Action Questionnaire' (AAQ) before completing a cold-pressor task. The results indicate that those subjects whose scores on the AAQ indicated higher levels of avoidance, and therefore lower levels of acceptance, had lower levels of pain endurance, pain tolerance and recovered more slowly from the task [16]. In parallel, a recent randomized study examined the influence of a brief set of recorded instructions on performance in a physical task [17]. Here, 74 individuals with low back pain completed seven physical tasks on two separate occasions. In the gap between performances participants listened to one of three sets of instructions which made suggestions about how performances could be improved. One set suggested controlling pain (control), another suggested willingly having the pain without attempts to control it (acceptance), a third 'inactive' control simply asked participants to perform the task as they had done before. Results indicated that larger improvements were recorded in the second performance for those subjects who received the acceptance instructions, 16.3%, rather than control instructions, 2.5%, while the performance of the inactive control group worsened by 8.3%.

Clinical studies of acceptance and patient functioning

Our previous review reported a number of studies that demonstrated associations between acceptance and measures of patient functioning in clinical populations. Work in this area has continued and advanced. Amongst other things, research has compared the statistical usefulness and explanatory power of acceptance to other more intuitive ways of conceptualizing responses to pain such as coping, control and catastrophizing.

In one recent study researchers compared measures of traditional coping strategies and acceptance in a sample of 230 pain patients. They found that acceptance variables were stronger than the coping variables as predictors of distress and disability. Further regression analyses showed that acceptance accounted for more unique variance even if coping variables were entered into the equation first, providing them with a statistical advantage [18]. Similar work has taken place in a prospective study where control based strategies where compared to acceptance. Here, 120 patients with chronic pain completed measures at two time points just under four months apart. An initial factor analysis revealed four different factors related to control and acceptance. The association between a factor labeled 'Activity Persistence,' key to the notion of acceptance, at time 1 and patient functioning at time 2 was greater than for the factors that related to control based approaches [19].

Along with coping and control, a number of studies have compared the role catastrophizing and acceptance. The results of a sample of 252 patients who had completed an interdisciplinary pain management treatment were examined to reveal the relative contributions of acceptance, catastrophising and pain intensity in relation to improvements observed during treatment. Multiple regressions suggested that both acceptance and catastrophizing accounted for significant levels of variance independent of, and larger than, the contribution of pain intensity [20]. A follow-up study more explicitly explored the relationships between catastrophizing, acceptance and patient functioning. The results, from 344 patients, suggested that it was acceptance that mediated the effects of catastrophic thinking on both functioning and on measures of depression, anxiety and avoidance [21].

Together this growing body of work seems to suggest that certain popular ways of thinking about pain, including notions of coping, control and catastrophising, may be improved by a better understanding of the role of acceptance both generally and as a potentially active process associated with the impact of coping, control and catastrophising themselves. The simple and direct relationships we intuitively imagine to exist, such as between cognitive variables and emotional functioning or daily activities, often appear to depend upon contextual elements, such as acceptance. For example, it has been long assumed that there is a straight forward relationship between processes such as attention, awareness, and vigilance and the impact of chronic pain on individual lives. Again, recent research suggests it may be useful to broaden this conceptualization [22]. Using data from 227 patients seeking treatment for chronic pain, this study compared the relationships of attention to pain and acceptance of pain with functioning. Results showed stronger correlations between acceptance scores and measures of functioning than achieved by the attention variable. Furthermore, regression equations found that attention explained little or no unique variance once acceptance was accounted for. In all of the studies reported above, results suggest that our ability to understand the difficulties facing chronic pain patients and our ability to intervene may be improved if we broaden our focus from traditional conceptualizations including such factors as “control” or “attention” to include the notion of acceptance.

Other processes within psychological flexibility

Support for the role of acceptance in the area of chronic pain appears to be strengthening, and at the same time there are other potentially useful companion processes that may promote further development in the field. While acceptance is key to the psychological model known as Acceptance and Commitment Therapy (ACT), it is

not the only process specified in this model. Indeed ACT involves six inter-related processes [4, 5]. These other processes are called: cognitive defusion, present moment awareness, self as context, values, and committed action. Together they combine to constitute greater 'psychological flexibility' (see figure 1). Psychological flexibility refers to an ability to be fully present in the current moment and from that position to be able to either maintain or to change ones behavior to more successfully pursue that which is most personally important according to what the situation directly affords. Evidence is growing steadily that these wider processes of psychological flexibility also have an important relationship with patient functioning. Recent examples of this research are highlighted below.

The influence of acceptance combined with values based action was studied in a recent prospective analysis where 115 UK based subjects completed measures twice an average of 18.5 weeks apart [23]. Results showed significant correlations between acceptance and values-based action at time 1 with factors such as pain, pain-related distress, pain-related anxiety and avoidance, depression, depression-related interference with functioning, and physical and psychosocial disability at time 2. Further multiple regressions suggest that together acceptance and values based action accounted for between 6.5% and 27.0% of variance in the measures of functioning at time 2. Similar to the work described earlier in the paper which compared acceptance to control, coping and catastrophizing, a recent study examined the combined influence of acceptance, mindfulness and values-based action to ‘anxiety sensitivity,’ which can be thought of as the fear of anxiety [24]. One hundred and twenty five subjects suffering from chronic pain completed self report measures related to the areas above. Correlations demonstrated that higher levels of anxiety sensitivity were associated with greater levels of pain, disability, and distress. However, subsequent regression analyses

showed that when acceptance, mindfulness and values-based action were taken into account the association between anxiety sensitivity and pain, disability, and distress was markedly reduced. Like the research described earlier in this paper, this suggests that therapeutic processes such as acceptance, mindfulness, and values may be important in expanding our understanding of the problems we refer to as anxiety sensitivity.

As well as examining the influence of wider ACT processes alongside acceptance, studies have begun to examine their influence in isolation and in relation rather than in combination to acceptance. One recent study examined the roles of values within chronic pain sufferers [25]. One hundred forty pain patients completed a brief values inventory along with other self report questionnaires including measures of pain, disability, depression and pain-related anxiety. Results showed that success in living according to one's values correlated with measures of acceptance and measures of disability, depression, and pain-related anxiety. Regressions also showed that values success predicted unique variance in functioning independent of acceptance.

As highlighted earlier, if researchers are measuring acceptance in chronic pain most use the CPAQ. However recent studies have also employed a more general measure of acceptance known as the Acceptance and Action Questionnaire-II (AAQ-II; Bond, Hayes, Baer et al., submitted for publication). This measure explores a broader notion of acceptance by examining an individual’s relationship with distressing thoughts, feelings and other physical symptoms more generally, not just in relation to chronic pain. In a study of 144 patients who completed measures of functioning, mindfulness and both the CPAQ and the AAQ-II, the AAQ-II was found to have significant correlations with depression, pain-related anxiety and both physical and psychosocial disability. In hierarchical regression the AAQ-II explained unique variance, independent of pain

intensity, mindfulness and pain acceptance as measured by the CPAQ, in measures patient disability and distress [26]. This research suggests that along with the willingness to experience distressing body sensations, thoughts and feelings associated with chronic pain, it may also be important for individuals to be willing to approach other distressing psychological experiences without defense more generally in their lives.

This broader notion of acceptance further widens our understanding of psychological flexibility and the potential to measure and influence it. In another resent study, 239 adults with chronic pain contacted in primary care completed both measures of acceptance (CPAQ and AAQ-II) and measures of mindfulness, values-based action, health status, and GP visits related to pain. Significant correlations were found between the components of psychological flexibility and measures of health and GP visits. In later regression analyses the combined measures of psychological flexibility accounted for an average of 24.1% of variance compared to an average of just 9.2% for pain intensity [27]. It is noteworthy that while much of the research on psychological flexiblility focused on patients treated within specialty care, this latest study included patients with chronic pain contacted in primary care, recruited through GPs. It appears that psychological flexibility has an important role to play for patients with low to moderate levels of complexity as well as for those with high complexity treated in specialist centers.

Together the above evidence suggests two things. First, it may be important to consider the role of acceptance of psychological experiences generally and not just tightly in relation to chronic pain. Second, rather than considering acceptance exclusively from other contextual processes, research is suggesting that it may be more powerful to combine it with other related processes to provide more impactful treatments enabling

patients to acquire greater psychological flexibility in their behavior. In the section below outcome studies are described that investigate precisely these processes.

Contextual and acceptance based treatment

Before describing recent advances in the treatment outcome literature it may be helpful to briefly outline how ACT with its focus on psychological flexibility approaches chronic pain in contrast to related models. Most psychological approaches to chronic pain would place the improvement of patient functioning as central. However different approaches seek to achieve this in different ways. Many approach painful thoughts, feelings and body sensations with the goal of seeking to reduce their frequency and control their occurrence. Contextual approaches which promote psychological flexibility, such as ACT, suggest an alternative pathway. They suggest the possibility of increasing willingness to be actively in contact with such thoughts and feelings, without defense, instead of acting in ways that are either dominated by them or trying to avoid them. Alongside this, with such experiences present, ACT would seek to enhance the movement of behavior towards one's chosen goals and values (see also table 1).

Since the last review, there have been additional treatment studies published that are based around ACT and psychological flexibility. Those from our group continue to be group-based and interdisciplinary. Treatment at our center spans five days a week and lasts between three to four weeks in total, a typical treatment day includes 6.5 hours of clinical contact including approximately 2.25 hours of body conditioning and 1.5 hours of psychological input. See McCracken (2005) for more information on methods and philosophy [28].

The last review reported the results of 108 pain patients who were followed from assessment to follow up, three months later [29]. In 2007, this study was replicated with an extended sample [20]. This sample included 252 patients (62.3% female; mean age=44, sd=11.4). During the course of treatment, reductions were found in measures of depression, pain-related anxiety, disability and pain while improvements were recording in direclty assessed physical functioning, walking speed and sit to stand frequency. In 2007we also reported the results of 53 pain patients who had significant self-care or mobility needs (64.2% female; mean age=48, sd=11.6). In order that these patients could access and participate in treatment they stayed on a hospital ward rather than more independent accommodation [30]. After four weeks of treatment significant improvements were found in activity tolerance, disability, depression, pain-related anxiety, pain-related distress and rest. Results were also relatively stable at three month follow up. Importantly, these results were not just statistically significant but also clinically meaningful. Specifically, medium to large effect sizes were observed, similar in magnitude to the sample of less disabled patients mentioned earlier (mean d=.75 for highly disabled versus d=.77 for less disabled).

Most recently we reported on outcomes from a further independent sample of 171 patients with chronic pain. (64.2% female; mean age=47.3, sd=11.4) [31]. As previously, significant improvements were found in variables including depression, disability, pain and pain related anxiety and. The average improvement from pre to post treatment was 47.3% (40.6% at follow up) and treatment effect sizes were medium or large, range pre- to post- treatment: d=0.67 to 1.76 (mean d=1.07), range pre- to follow-up: d=0.48 to 1.51 (mean d=0.89) This study also measured reliable change and found that 75.4% demonstrated reliable change in one or more key domain (disability, pain-related anxiety, or depression) and 61.4% showed reliable change in two or more. Process

analyses suggest that improvements in both acceptance of pain and values based action were related to improvements in domains of functioning accounting for 17% of the variance in the outcomes measured.

Treatment outcome evidence for ACT and psychological flexibility in chronic pain continues to grow, including studies done outside of our center. In 2009, Vowles and colleagues published the results of two pilot studies [32]. One was carried out within a university-based outpatient pain management clinic. Here, patients experienced eight, 90 minute group sessions. Results found that out of the 11 patients in treatment 9 improved at least to a moderate level in terms of emotional and physical functioning. The second study was situated within a Veterans Administration hospital in the US. In this pilot, five, 90 minute sessions of either ACT or CBT were compared. Again, 5 out of 6 patients in the ACT group and 3 of 5 in the CBT group showed at least moderate improvement in emotional and physical functioning.

A Swedish group, based in Stockholm, has also published a number of treatment outcome studies in recent years. In a RCT published in 2008, 21 pain patients with whiplash associated disorders were compared with waiting list controls (76.2% female; mean age 48.2, sd=7.8) [33]. Those who received treatment based on ACT showed greater improvements with regard to disability, life satisfactions, fear of pain, depression, and psychological flexibility compared to the waiting list group at both post treatment and at follow-ups four and seven months later. Two further studies from this group have applied these processes and methods to an adolescent population [34, 35].

Alongside treatment that is delivered in traditional face-to-face, group or individual formats, a recent RCT has tested the effectiveness of using ACT material presented in a

self-help book [36]. Over 6 weeks, 6 subjects read the self-help book, completed accompanying exercises and received telephone support. Eight other subjects made up a control condition and 5 of these later also completed the active condition. Compared with the control condition, active subjects demonstrated statistically significant improvements with large effect sizes for acceptance, quality of life, satisfaction with life, and values improvements. These findings suggest that use of the ACT self help book with minimal therapist contact improved important aspects of functioning in people with chronic pain.

The evidence above suggests that sufferers of chronic pain can significantly benefit as a result of a variety of treatments based around ACT and psychological flexibility. Both outcome and follow up data are promising. These results combined with those reported in the last review have had significant implications for the status of this type of work within the wider psychological community. In recent months, the Society of Clinical Psychology within the American Psychological Association (APA, Division 12) has confirmed that there is now 'modest research support' for Acceptance and Commitment Therapy in the treatment of chronic pain [37]. This support is based on strict and conservative criteria which are applied to classify empirically-validated treatments by the APA. Furthermore they anticipate upgrading their level of support to strong once further research trails with active control conditions have been published.

Conclusion

The evidence presented in this review suggests that where attempts to control chronic pain or other unwanted psychological experiences associated with it are unsuccessful acceptance and other aspects of psychological flexibility can prove important beneficial

processes. Support from multiple types of studies continues to grow for the usefulness of these ACT based processes, from experimental studies based in laboratories to treatments using group-based methods, individual-based methods, and even self help books. Evidence also suggests that the studies of processes of acceptance can help increase our understanding of the role of other psychological factors involved in chronic pain such as coping, attention, and catastrophizing.

Acceptance is not about knowing or believing that pain is not going to go away. It is primarily a matter of taking actions that include willingness to experience distressing body sensations, thoughts, feelings and, memories that can present barriers to functioning. In isolation it might seem odd to ask patients to open up to such experiences, however, it can be the most pragmatic course of action to take when one's goals and values are at stake. Acceptance is just one part of a broader model of psychological flexibility, a model that also highlights the importance of clarifying these goals and values and taking action toward them. Perhaps it becomes more understandable to include acceptance in treatments for chronic pain when it is understood that, consistently, at the level of the patient's direct experience this is understood as the only way, or the best way, for this person to achieve the life they want with family, friends, work, leisure, and so on. Thus acceptance is not an end in itself and it is success that legitimizes acceptance.

Together with the other processes that are part of the model of psychological flexibility, and the data on treatment outcome, the collected evidence for ACT in the area of chronic pain is now such that ACT has gained status as an empirically supported treatment for chronic pain. The treatment approach described in this review appears to

offer exciting opportunities to researchers, clinicians and, to those who suffer with chronic pain.

References

1. Hayes SC, Gifford EV: The trouble with language: Experiential avoidance, rules, and the nature of verbal events. Psychological Science 1997, 8:170-173.
2. Wenzlaff RM, Wegner DM: Thought Suppression. Annu Rev Psychol 2000, 51:59-91.
3. McCracken LM, Vowles KE: Acceptance of chronic pain. Curr Pain Headache Rep 2006, 10:90-94.
4. •• Hayes SC, Luoma J, Bond F, et al.: Acceptance and Commitment Therapy: Model, processes, and outcomes. Behav Res Ther 2006, 44:1-25.
   Review article that provides an excellent synopsis of the philosophy, theory and core processes involved in ACT. Also summarises the correlational, component, process and outcome evidence available at the time (2006) from a number of clinical settings.
5. Hayes SC, Strosahl K, Wilson KG: Acceptance and commitment therapy: an experiential approach to behavior change. New York: Guilford Press; 1999.
6. •• Ruiz FJ: A Review of Acceptance and Commitment Therapy (ACT) empirical evidence: Correlational, experimental psychopathology, component and outcome studies. Rev Int Psicol Ter Psicol / Intern Jour Psych Psychol Ther 2010, 10:125-162.
   Recent review article (2010) which provides a synopsis of the philosophy, theory and core processes involved in ACT. Also summarises the correlational,

experimental, psychopathology, component, and outcome evidence in clinical and health psychology and other settings.

7. Fordyce WE: Behavioral methods for chronic pain and illness. St. Louis: Mosby; 1976.

8. Keefe FJ, Rumble ME, Scipio CD, et al.: Psychological aspects of persistent pain: current state of the science. J Pain 2004, 5:195-211.

9. McCracken LM, Vowles KE, Eccleston C: Acceptance of chronic pain: component analysis and a revised assessment method. Pain 2004, 107:159-166.

10. Vowles KE, McCracken LM, McLeod C, Eccleston C: The Chronic Pain Acceptance Questionnaire: confirmatory factor analysis and identification of patient subgroups. Pain 2008, 140:284-291.

11. Reneman MF, Dijkstra A, Geertzen JH, Dijkstra PU: Psychometric properties of Chronic Pain Acceptance Questionnaires: A systematic review. Eur J Pain 2009, 4:457-465.

12. Nilges P, Koster B, Schmidt CO: Pain acceptance - concept and validation of a German version of the chronic pain acceptance questionnaire. Schmerz 2007, 21:57-58, 60-67.

13. Cheung MN, Wong TC, Yap JC, Chen PP: Validation of the Chronic Pain Acceptance Questionnaire (CPAQ) in Cantonese-speaking Chinese patients. J Pain 2008, 9:823-832.

14. McCracken LM, Gauntlett-Gilbert J, Eccleston C: Acceptance of pain in adolescents with chronic pain: Validation of an adapted assessment instrument and preliminary correlation analyses. Eur J Pain 2009, 14:316-320.

15. Fish RA, McGuire B, Hogan M, et al.: Validation of the Chronic Pain Acceptance Questionnaire (CPAQ) in an Internet sample and development and preliminary validation of the CPAQ-8. Pain 2010, 149:435-443.

16. Feldner MT, Hekmat H, Zvolensky MJ, et al.: The role of experiential avoidance in acute pain tolerance: a laboratory test. J Behav Ther Exp Psychiatry 2006, 37:146-158.
17. Vowles KE, McNeil DW, Gross RT, et al.: Effects of pain acceptance and pain control strategies on physical impairment in individuals with chronic low back pain. Behav Ther 2007, 38:412-425.
18. McCracken LM, Eccleston C: A comparison of the relative utility of coping and acceptance-based measures in a sample of chronic pain sufferers. Eur J Pain 2006, 10:23-29.
19. McCracken LM, Vowles KE, Gauntlett-Gilbert J: A prospective investigation of acceptance and control-oriented coping with chronic pain. 2007, 30:339-349.
20. Vowles KE, McCracken LM, Eccleston C: Processes of change in treatment for chronic pain: the contributions of pain, acceptance, and catastrophizing. Eur J Pain 2007, 11:779-787.
21. Vowles KE, McCracken LM, Eccleston C: Patient functioning and catastrophizing in chronic pain: the mediating effects of acceptance. Health Psychol 2008, 27:S136-S143.
22. McCracken LM: A contextual analysis of attention to chronic pain: what the patient does with their pain might be more important than their awareness or vigilance alone. J Pain 2007, 8:230-236.
23. McCracken LM, Vowles KE: A prospective analysis of acceptance of pain and values-based action in patients with chronic pain. Health Psychol 2008, 27:215-220.
24. McCracken LM, Keogh E: Acceptance, mindfulness, and values-based action may counteract fear and avoidance of emotions in chronic pain: an analysis of anxiety sensitivity. J Pain 2009, 10:408-415.

25. McCracken LM, Yang SY: The role of values in a contextual cognitive-behavioral approach to chronic pain. Pain 2006, 123:137-145.

26. McCracken LM, Zhao-O'Brien J: General psychological acceptance and chronic pain: There is more to accept than the pain itself. Eur J Pain 2010, 14: 170-175.

27. McCracken LM, Velleman SC: Psychological flexibility in adults with chronic pain: a study of acceptance, mindfulness, and values-based action in primary care. Pain 2010, 148: 141-147.

28. •• McCracken LM: Contextual Cognitive-Behavioral Therapy for Chronic Pain. Seattle: IASP Press; 2005.

Book length overview of the application of contextual approaches to individuals with chronic pain. Specific experiential exercises and clinical material are included.

29. McCracken LM, Vowles KE, Eccleston C: Acceptance-based treatment for persons with complex, long standing chronic pain: a preliminary analysis of treatment outcome in comparison to a waiting phase. Behav Res Ther 2005, 43:1335-1346.

30. McCracken LM, MacKichan F, Eccleston C: Contextual cognitive-behavioral therapy for severely disabled chronic pain sufferers: effectiveness and clinically significant change. Eur J Pain 2007, 11:314-322.

31. •• Vowles KE, McCracken LM: Acceptance and values-based action in chronic pain: a study of treatment effectiveness and process. J Consult Clin Psychol 2008, 76:397-407.

The most recent outcome evidence from the Bath Centre for Pain Services, published in the Journal of Consulting and Clinical Psychology. Results detail statistically significant changes, effect size calculations and reliable change analyses.

32. Vowles KE, Wetherell JL, Sorrell JT: Targeting Acceptance, Mindfulness, and Values-Based Action in Chronic Pain: Findings of Two Preliminary Trials of an Outpatient Group-Based Intervention. Cogn Behav Pract 2009, 16:49-58.

33. Wicksell RK, Ahlqvist J, Bring A, et al.: Can exposure and acceptance strategies improve functioning and life satisfaction in people with chronic pain and whiplash-associated disorders (WAD)? A randomized controlled trial. Cogn Behav Ther 2008, 37:169-182.

34. Wicksell RK, Melin L, Olsson GL: Exposure and acceptance in the rehabilitation of adolescents with idiopathic chronic pain - a pilot study. Eur J Pain 2007, 11:267-274.

35. Wicksell RK, Olsson GL, Melin L: The Chronic Pain Acceptance Questionnaire (CPAQ)-further validation including a confirmatory factor analysis and a comparison with the Tampa Scale of Kinesiophobia. Eur J Pain 2009, 13:760-768.

36. Johnston M, Foster M, Shennan J, et al.: The effectiveness of an Acceptance and Commitment Therapy self-help intervention for chronic pain. Clin J Pain 2010, 26:393-402.

37. Available at http://www.div12.org/PsychologicalTreatments/treatments/chronicpain_act.html. Accessed September 2010.

Table 1:
Processes targeted within ACT for chronic pain: definitions and examples of methods

Process	Definition	Examples of Methods
Acceptance	A continuing willingness to experience difficult thoughts, feelings, body sensations and memories without defense.	Any exercises that ask patients if they are willing to experience and sit with discomfort in a way that is also relevant to reaching goals and values. This can include what is typically referred to as "exposure."
Cognitive defusion	An ability to watch and observe thoughts without being unnecessarily dominated or ruled by them.	Exercises that create an experience of "the mind" as the sources of thoughts and orient the person as a listener or recipient of these thoughts.
Self as context	A perspective on self that is unchanged by time or experience.	Asking the person to notice a distinction in their experience between the thinking mind and the observing mind.
Contact with the present moment	An ability to be aware of how thoughts often have a past or future quality and to be able to more frequently connect with the present.	Exercises that include patients noticing the flow of thoughts and identifying the point in time reflected in that thought. Also, most mindfulness exercises.
Values	Clarity and the capacity to follow what is most personally important.	Exercises such as asking a person what they would like others to say about them at their 80th birthday or what they would most want to do if all of the barriers to doing it were eliminated.
Committed Action	Sustained, sustainable, and flexible behaviour in the direction of values.	Flexible, practical, goal setting, and dealing with barriers that occur.
Together, the processes above promote **Psychological Flexibility**: the ability to be fully present in the current moment and from that position to be able to either maintain or to change one's behavior to more successfully pursue that which is personally important according to what the situation directly affords.		

*For further information regarding the indicative content see references 5 and 28.

Figure 1:
The relationship between psychological flexibility, acceptance and related processes