
Acceptance and Commitment Therapy and Mindfulness for Chronic Pain

Model, Process, and Progress

Lance M. McCracken

King's College London and Guy's and St Thomas' NHS Foundation Trust, London, England

Kevin E. Vowles

University of New Mexico

Over 30 years ago, treatments based broadly within cognitive behavioral therapy (CBT) began a rise in prominence that eventually culminated in their widespread adoption in chronic pain treatment settings. Research into CBT has proliferated and continues today, addressing questions very similar to those addressed at the start of this enterprise. However, just as it is designed to do, the process of conducting research and analyzing evidence reveals gaps in our understanding of and shortcomings within this treatment approach. A need for development seems clear. This article reviews the progress of CBT in the treatment of chronic pain and the challenges now faced by researchers and clinicians interested in meeting this need for development. It then focuses in greater detail on areas of development within CBT, namely acceptance and commitment therapy (ACT) and mindfulness-based approaches, areas that may hold potential for future progress. Three specific recommendations are offered here to achieve this progress.

Keywords: chronic pain, cognitive behavior therapy, acceptance and commitment therapy, mindfulness

P psychological approaches have a long history of success in the treatment of chronic pain. For the past three decades, this work has been dominated by broadly cognitive-behavioral theories and methods, certainly since the first comprehensive description of these in the early 1980s (Turk, Meichenbaum, & Genest, 1983). Approaches to chronic pain based on cognitive-behavioral therapy (CBT) are deemed the most clinically effective and cost-effective approaches to chronic pain today, especially compared with commonly used medical approaches (Turk & Burwinkle, 2005; Gatchel & Okifuji, 2006). While CBT has had success with chronic pain, its effectiveness also has limits and could be better.

It is possibly a pivotal time in the development of CBT for chronic pain owing to a confluence of events, in the wider field of CBT and in the field of chronic pain. These events include emerging gaps in current evidence, particularly with respect to therapy processes, and specific developments in theory and methods designed with an emphasis on these processes. Notable among these developments are treatment approaches that depart from the logic of everyday thinking. These approaches “normalize” human suffering to a certain extent. They regard suffering

as inherent in the human condition and as built into the design of human experience and behavior. They also question the utility of normal thinking, believing, analyzing, and problem solving as predominant means for successfully addressing this suffering. These approaches reflect an emphasis on experiential methods rather than didactic ones, on metaphorical uses of language rather than only direct literal uses, on changing responses to symptoms rather than symptoms themselves, and on qualities in the behavior of the treatment provider. These features are reflected prominently in approaches referred to as *acceptance-based* and *mindfulness-based* (Hayes, Follette, & Linehan, 2004) and can be called *contextual cognitive behavioral therapy* (CCBT; Hayes, Villatte, Levin, & Hildebrandt, 2011; McCracken, 2005).

CCBT approaches may promote progress, improve the focus of further research into chronic pain, and promote a next generation of treatment developments. A key strategy for improving treatment effectiveness may be to look inside these models not for better facts or methods as such but for how the philosophies and theories contained there can provide guidance for our behavior as researchers and clinicians. We suggest that progress will occur not by getting more data alone but by organizing our efforts around specific clearly stated assumptions and goals and around a unified theoretical model. We further suggest that the philosophy and theory underlying acceptance and commitment therapy (ACT), with its focus on psychological flexibility (Hayes, Strosahl, & Wilson, 1999), may provide the guidance needed.

Editor's note. This article is one of nine in the February–March 2014 *American Psychologist* “Chronic Pain and Psychology” special issue. Mark P. Jensen was the scholarly lead for the special issue.

Authors' note. Lance M. McCracken, Psychology Department, Institute of Psychiatry, King's College London, London, England, and INPUT Pain Management Centre, Guy's and St Thomas' NHS Foundation Trust, London, England; Kevin E. Vowles, Department of Psychology, University of New Mexico.

Correspondence concerning this article should be addressed to Lance M. McCracken, Health Psychology Section, Psychology Department, Institute of Psychiatry, King's College London, 5th Floor, Bermondsey Wing, Guy's Campus, London SE1 9RT, England. E-mail: lance.mccracken@kcl.ac.uk



**Lance M.
McCracken**

In this article we review the evidence base for cognitive behavioral approaches to chronic pain. Next, we identify key challenges to the development of these methods. We then provide an overview of ACT, and the psychological flexibility model that underlies it, as an approach to chronic pain and examine the related area of mindfulness-based approaches. Finally, we present potential strategies for continued progress within this area.

The Success of CBT for Chronic Pain

There are two core principles at the heart of CBT approaches to chronic pain. The first is that feelings of pain and aspects of emotional, physical, and social functioning impacted by pain are both related *and* separable, particularly for treatment purposes. This means that problems with functioning related to pain can be addressed even if the pain is not targeted directly and remains unchanged. The second principle is that psychological factors can influence the experience of pain itself. Approaches to chronic pain that incorporate these core principles have been some of the most innovative among all approaches to physical health problems within clinical psychology (Fordyce, 1976; Turk et al., 1983). The core principles of CBT are now widely disseminated in the practice of chronic pain management.

There are at least five systematic reviews relevant to current CBT for chronic pain, each generally concluding that these approaches can produce significant benefits, such as reduced pain and improved daily functioning (Eccleston, Williams, & Morley, 2009; Guzmán et al., 2001; Hoffman, Papas, Chatkoff, & Kerns, 2007; Morley, Eccleston, & Williams, 1999; Scascighini, Toma, Dober-Spielmann, & Sprott, 2008).

Two of the meta-analyses are particularly notable as they were done by the same group with similar methods,

twice, over a period of 10 years. In 1999 this group published results from their analyses of 25 trials of cognitive and behavioral treatment for chronic pain (Morley et al., 1999). They showed that in comparison to waiting list conditions, these treatments produced significant benefits in pain reduction, emotional functioning, coping, pain behavior, activity, and social role functioning. The median effect size (d) was 0.50. In comparison to active treatment control conditions, such as visits to a pain clinic, physiotherapy, occupational therapy, or education, these treatments produced significant benefits in pain reduction, coping, and pain behavior. The overall median effect size here was smaller, $d = 0.17$.

When a similar meta-analysis was published by the same group 10 years later, the overall conclusion was positive but less emphatic (Eccleston et al., 2009). This more recent review applied stricter inclusion criteria in identifying studies for analysis. These criteria required that each trial include a psychological treatment with actual “definable psychotherapeutic content” and that each treatment arm have 10 or more participants at the end of treatment. The authors’ analyses of 40 trials showed that cognitive and behavioral treatments produced small effects on pain and disability and a small effect on mood, particularly at follow-up. Further analyses showed that the quality of the research design significantly correlated with the publication year of the study ($\rho = .45$), but the quality of the treatment did not ($\rho = -.07$). The authors concluded that the evidence for cognitive and behavioral treatments for chronic pain is “weak” and that the quality of treatments, or the reporting of these treatments, apparently is not improving over time (Eccleston et al., 2009).

Challenges in CBT for Chronic Pain

The ultimate challenge in psychological treatment development is to find highly effective treatments that produce clinically meaningful benefits specifically linked to the psychological processes hypothesized within the treatment model (Kazdin, 2007). Here, *process* means the directly targeted, theoretically based, psychological elements deemed to affect improvements in treatment outcome variables. This is sometimes called therapeutic *mechanism*. This is no less the goal for chronic pain treatment than in any other area of clinical psychology (Jensen, 2011; Morley & Keefe, 2007). When one can identify processes of change that are both sufficient and necessary for the benefits observed in treatment, and identify the methods that impact these processes, then one is able to optimize treatment impact.

Rather than following processes, methods could follow fads, common sense, therapist emotional reactions, or therapist beliefs (Waller, 2009). Unfortunately, emotional reactions and common sense are often compelling but misleading (Schulte & Eifert, 2002). And sometimes beliefs better reflect the roots of the problem than the solution to the problem, and this includes both professional (Waller, 2009) and patient beliefs. If it is the case that the quality of CBT for chronic pain is not improving and that effect sizes



Kevin E. Vowles

are not getting larger over time, a deeper, more explicit focus on process may help guide the development of future treatment methods.

Research interest in treatment processes within CBT in general is increasing (David & Montgomery, 2011; Kazdin, 2007; Murphy, Cooper, Hollon, & Fairburn, 2009; Stice, Rohde, Seely, & Gau, 2010). And the results are not always consistent with the traditional assumptions. In contrast to the traditional framework of CBT, and contrary to common sense, one may not need to think or believe different thoughts or beliefs in order to change one's behavior or to recover from psychological problems. There is, in fact, an accumulating rate of failure to find evidence that confronting negative automatic thoughts and changing the content of beliefs is *necessary* to affect improvements in CBT for such conditions as depression and anxiety disorders (D. D. Burns & Spangler, 2001; Dimidjian et al., 2006; Garratt, Ingram, Rand, & Sawalani, 2007; Jarrett, Vittengl, Doyle, & Clarke, 2007; Longmore & Worrell, 2007; Stice et al., 2010). Sometimes trying to adopt positive thinking patterns, such as about oneself, may have an effect opposite to the intended effect, and may lower mood and self-esteem, or may be effective only for some and not for others (Wood, Perunovic, & Lee, 2009; see also Haeffel, 2010). This is not to say that methods directed at changing the content of thoughts or beliefs are always either inert or harmful. However, evidence indicates they may not be necessary for treatment success and may carry risks.

There is a lack of clarity in treatment process within CBT for chronic pain. From a traditional CBT perspective, an assumed mechanism of treatment is change in the content of thoughts related to pain, depression, or anxiety, including constructs such as catastrophizing, hopelessness, helplessness, and perceived control (Jensen, 2011; Morley

& Keefe, 2007). Measures of these variables clearly correlate with measures of current functioning, and changes in some of these clearly correlate with improvements in functioning during treatment (e.g., J. W. Burns, Kubilus, Bruehl, Harden, & Lofland, 2003; Jensen, Turner, & Romano, 2001, 2007; Woby, Watson, Roach, & Urmston, 2004). However, this is not the complete story. First, it is not clear that methods aimed at changing thought content related to pain are specifically necessary for changes in this content. It appears thought content can change even when cognitive change methods are not applied (Smeets, Vlaeyen, Kester, & Knottnerus, 2006; Vowles, McCracken, & Eccleston, 2007). Exaggerated negative thoughts about pain can be successfully induced, but doing so does not necessarily increase pain or decrease pain tolerance (Severeijns, van den Hout, & Vlaeyen, 2005). Further, attempts to change thoughts sometimes, paradoxically, increase the severity of pain (Goubert, Crombez, Eccleston, & Devulder, 2004; Masedo & Esteve, 2007; Sullivan, Rouse, Bishop, & Johnston, 1997). Hence, from a number of perspectives, methods to target the content of thoughts and beliefs about pain may not be critical to chronic pain treatment, and again, the necessity of this content change remains unclear.

Another presumed mechanism of treatment effect in CBT for chronic pain derives from a model of coping skills training, adherence, and maintenance (Turk et al., 1983). According to this model, for those disabled and distressed by chronic pain, the experience represents a stressor that overwhelms coping abilities. It follows that when those who are thus overwhelmed are able to learn, and consistently use, more effective coping strategies, their distress will be reduced and their functioning improved. This model is entirely logical.

In one study that investigated the model of skills training and adherence, a group of 2,345 patients completing a multidisciplinary course of CBT were assessed after treatment and at follow-up for their adherence to traditional CBT skills, including stretching and physical exercise, activity pacing, and "methods for challenging and changing unhelpful thoughts" (Curran, Williams, & Potts, 2009). In subsequent analyses, adherence to skills use was significantly associated with follow-up outcomes. However, the variance accounted for was small, just 3.0%, which led the authors to question the importance of this adherence. Results such as these are not unique. In another study of 114 people with chronic pain completing a multidisciplinary version of CBT based on ACT, more or less the same traditional skills were assessed following treatment (Vowles & McCracken, 2010). Here the use of these skills did indeed increase significantly during treatment. However, this increase was unrelated to improvements in outcome measures at follow-up. Results from both of these studies failed to support the necessity of the skills trained in traditional CBT for chronic pain. In fact, they suggest that when skills training is conducted, there must be other treatment processes changing at the same time, processes that are possibly not explicitly targeted.

Failure to adequately investigate and clarify processes in treatment may lead to confusion over choice of methods and possibly to an overly inclusive approach in which patients get a little bit of everything. In turn, this may slow the development of methods. The methods used within CBT in the 1980s included training in skills for managing moods, attention, thoughts, and activity: relaxation, physical exercise, techniques for altering negative thoughts and beliefs and increasing positive ones, exposure-based methods, and goal setting. Certainly, with one or two exceptions, the methods used in most centers following a CBT model today are fundamentally the same as they were more than 25 years ago.

ACT for Chronic Pain: Model, Process, and Evidence

ACT is a treatment approach within the family of CBT. It is designed to be applicable to a broad range of psychological problems. It has roots in learning theory and in laboratory studies of basic behavioral processes. It also extends this tradition with laboratory research into processes of language and cognition guided by what is called relational frame theory (Hayes, Barnes-Holmes, & Roche, 2001). ACT includes a combination of acceptance and mindfulness methods along with activation and behavior change methods. It includes an emphasis on cognitive processes and emotional experiences, just as in other CBT approaches (Hayes et al., 1999). A recent meta-analysis of 66 experimental laboratory studies of ACT-related processes concluded that these are broadly supportive of their positive psychological effects and theoretical consistency (Levin, Hildebrandt, Lillis, & Hayes, 2012).

ACT can be distinguished from other approaches within CBT in the philosophical assumptions and the scientific strategies it adopts. ACT adopts a pragmatic approach to knowledge, as opposed to one that relies on correspondence with reality. Here, *pragmatic* means successfully reaching the goals of the analyses. The approach to psychological events in ACT is specifically functional and contextual, placing the emphasis on whether these events can be observed to have a relationship of influence with a particular behavior pattern and whether they are potentially manipulable by psychological methods. Thoughts or feelings are not deemed helpful or unhelpful from their form, frequency, or appearance alone. It is this core *functional contextual* framework that allows within ACT more routes toward healthy functioning: one where methods can seek to reduce the intensity or frequency of psychological experiences such as pain, fear, or sadness, if this achieves improved functioning, and another where methods seek to reduce the influence these experiences exert over behavior without necessarily reducing their intensity or frequency.

Within ACT, a set of broadly applicable and integrative treatment processes is proposed, the core being *psychological flexibility*. Psychological flexibility is the capacity to continue with or change behavior, guided by one's goals, in a context of interacting cognitive and direct non-

cognitive influences. Here there is an important distinction between two sets of influences on behavior, those based in cognitive processes and those not. Simply put, there are influences that arise from thinking, judging, analyzing, "information processing," or the mind, and there are influences that arise from direct sensory contact with the world. These influences are in a constant process of interaction in the coordination of behavior. The one hitch is that the cognitive-based influences can readily dominate without a person's being aware that this is happening, and this can lend behavior an ineffective quality. *Psychological inflexibility*, then, is based in this particular quality of behavior being dominated by cognitively based influences and being insulated from other sources of influence.

The processes behind psychological inflexibility present a model for how thoughts, beliefs, rules, and instructions, as well as pain or other psychological experiences, can narrow the range of an individual's available responses and present obstacles to healthy behavior and behavior change. Psychological flexibility includes a set of subprocesses—acceptance, cognitive defusion, flexible attention to the present, self-as-observer, values-based action, and committed action (Hayes et al., 1999)—more succinctly summarized as behavior that is open, aware, and active (Hayes et al., 2011) or open, centered, and engaged (Hayes, Strosahl, & Wilson, 2012). The terms for the six processes of psychological flexibility are not themselves technically precise descriptions of basic psychological processes but are what is called *mid-level* terms (Hayes et al., 2012). These terms are intended to provide a linkage between (a) basic psychological processes, such as operant conditioning, stimulus control, and "relational responding," a process from relational frame theory, and (b) the activities of clinicians and clinical researchers.

As mentioned, psychological flexibility is intended to be an inherently integrative process. The component process of *cognitive defusion*, for example, yields methods that address problems based in cognitive processes, thoughts, and beliefs, no matter the content, whether they are blaming, catastrophic, defeated, discouraged, fearful, helpless, hopeless, or self-critical. Cognitive defusion methods aim to reduce the dominance and impact of this content without necessarily changing the content itself. The component process of *acceptance*, another example of an integrative process, yields methods to address feelings, whether these feelings include anger, anxiety, depression, fear, guilt, pain, or shame. Acceptance methods aim to promote qualities of *engaging* and *refraining*, engaging in goal-directed action when that includes unwanted feelings and refraining from attempts to control feelings when attempts at control block success. From a functional contextual framework, defusion and acceptance are not processes that must be done all of the time; they are instead useful when they serve better functioning, depending on the situation, and when they are used according to the patient's goals and values.

This highlighting of defusion and acceptance is not to leave out the integrative qualities of the other facets of psychological flexibility. Certainly both present-focused attention and self-as-observer extend the reach of ACT into

emotional and cognitive processes, and values and committed action extend its reach into issues of motivation, positive behavioral regulation, and maintenance of behavior change.

There is debate as to whether ACT includes anything new (Hofmann & Asmundson, 2008). Certainly, ACT adopts familiar, widely used methods such as exposure, behavioral activation, skills training, mindfulness, and methods for building a close and intensive therapeutic relationship, for example. It does this consciously and transparently. Nonetheless, there are discriminable distinctions in the current practice of CBT. Brown, Gaudiano, and Miller (2011) conducted an online survey of 176 licensed, practicing, cognitive-behavioral therapists, and 88 identified themselves as either traditional cognitive-behavioral therapists or acceptance-based therapists. Results showed that these two groups were similar in most respects assessed, such as in their attitudes toward evidence-based practice and in thinking style. The primary difference between the groups was the treatment techniques they used. Those who self-described as acceptance-based in orientation reported greater use of exposure, mindfulness, and family systems techniques and a wider range of total techniques. Those who self-described as having a traditional CBT orientation reported greater use of cognitive restructuring and relaxation. Data such as these demonstrate that there are observable differences in current practices whether one wants to call it one thing or another. If we set aside differences in methods, the significant distinctness of ACT is its integration around a core process and the approach it adopts to scientific progress.

The evidence base for ACT has grown rapidly in recent years and includes several systematic reviews focused on a mix of disorders and generally showing medium-sized average effect sizes (Öst, 2008; Powers, Zum Vörde Sive Vörding, & Emmelkamp, 2009; Ruiz, 2010; see also Gaudiano, 2011). In each of these reviews, it was concluded that ACT is neither inferior nor superior in efficacy compared with current established approaches.

There are now at least six randomized controlled trials (RCTs) providing support for the use of ACT for chronic pain (Buhrman et al., 2013; Dahl, Wilson, & Nilsson, 2004; Thorsell et al., 2011; Wetherell et al., 2011; Wicksell, Ahlqvist, Bring, Melin, & Olsson, 2008; Wicksell et al., 2012). Additional support for ACT as applied to chronic pain comes from a number of partially controlled trials (e.g., Johnston, Foster, Shennan, Starkey, & Johnson, 2010; McCracken, Vowles, & Eccleston, 2005; Vowles, Wetherell, & Sorrell, 2009), from a series of effectiveness studies (e.g., Vowles & McCracken, 2008; McCracken & Gutiérrez-Martínez, 2011) producing average effect sizes across outcome domains in the large range, $d_s = 0.85\text{--}0.89$, and from follow-up data at three years posttreatment (Vowles, McCracken, & Zhao-O'Brien, 2011) showing an average effect size in the medium range, $d = .57$. Consistent positive effects of ACT include increased physical and social functioning and decreased pain-related medical visits, even three years following treatment. ACT is listed by the American Psychological Association's Division 12 as

an empirically supported treatment with "strong research support" for general chronic pain (Society of Clinical Psychology, 2011). A meta-analysis of studies of acceptance- and mindfulness-based treatments for chronic pain ($N = 22$) concluded that these approaches appear at least equally effective as traditional CBT (Veehof, Oskam, Schreurs, & Bohlmeijer, 2011).

There have been few trials comparing ACT with traditional CBT (Wetherell et al., 2011). One of the problems involved in such comparisons is that ACT *is* CBT. While ACT and traditional CBT include distinct treatment processes, they also include many similar methods. This means that very large sample sizes would be needed to show the superiority of one of these approaches. A predominant focus on potential head-to-head superiority is likely to be expensive to do and may not by itself yield progress. Instead, a better strategy may be to focus on examining treatment processes in order to identify methods and moderators that optimize change in these key processes and to look for improvements in other areas, such as in longer term outcomes, better patient acceptability, easier access, and perhaps benefits for treatment providers.

Most of the ACT trials for chronic pain have investigated treatment process to some extent. Results from these analyses show that increases in acceptance of pain correlate with improvements during treatment in the form of reduced anxiety, depression, and disability (McCracken et al., 2005; Vowles & McCracken, 2008), and increases in values-based action correlate with improvements observed at a three-month follow-up in the same outcomes (Vowles & McCracken, 2008). Also, increases in acceptance of pain, general psychological acceptance, mindfulness, and values-based action during the active phase of treatment significantly correlated with improvements in anxiety, depression, and disability, at a three-month follow-up, independent of changes in pain (McCracken & Gutiérrez-Martínez, 2011).

Wicksell, Olsson, and Hayes (2010) explored processes of change in a trial of ACT for chronic pain using a formal statistical test of mediation of treatment effects on life satisfaction and disability. They found that psychological flexibility significantly mediated these outcomes, as predicted. Pain, emotional distress, fear of movement, and self-efficacy did not. These findings support the notion that ACT produces significant improvements in outcome for people with chronic pain and that, when it does, these improvements are specifically mediated by the therapeutic process specified in the underlying theory, and not by processes specified in other theories.

Mindfulness: Method, Process, and Outcome

Mindfulness-based methods are deemed effective for conditions such as chronic pain both in terms of symptom reduction and improved emotional functioning (Baer, 2003; Grossman, Niemann, Schmidt, & Walach, 2004). At the same time, there may be opportunities for development

and for greater integration between ACT and mindfulness-based approaches.

The term *mindfulness* presents potential confusion as it is used to describe both a set of methods and the psychological processes impacted by these methods, processes that include nondefensive, moment-to-moment, and “non-judgmental” awareness (Baer, 2003). That said, one area for development in mindfulness studies is the examination of this issue of treatment process. Given the relatively large number of outcome studies of mindfulness-based approaches for chronic pain, there have been surprisingly few directly addressing mindfulness per se as a process of change and even fewer that have attempted to separate component processes within mindfulness. In a study of 174 participants who received a mindfulness-based stress reduction intervention (MBSR; Kabat-Zinn, 1990) for problems with stress, chronic pain, or anxiety, time spent in home practice of mindfulness correlated with improvements in particular facets of mindfulness and with improvements in psychological well-being, levels of stress, and psychological symptoms (Carmody & Baer, 2008). A similar result was demonstrated in another study of MBSR specifically focused on treatment for chronic pain (Rosenzweig et al., 2010). Here a relationship was shown between home practice and improvements in distress symptoms and general health. Nonetheless, neither of these studies showed a specific causal role for facets of mindfulness processes or methods.

The limited data linking specific mindfulness-related processes to improvements in outcomes have been noticed. There have been attempts to identify specific processes within mindfulness. One of these identified such intriguing processes as re-perceiving, decentering, and intimate detachment (Shapiro, Carlson, Astin, & Freedman, 2006). Yet these do not seem to achieve a quality of greater precision or direct manipulability compared with mindfulness itself. They also do not link with a theoretical framework or a comprehensive set of behavior change principles. Hence, their utility for research and treatment development is unclear.

Another area for further development in studies of mindfulness-based treatment methods for chronic pain is outcome. Previous studies of mindfulness have focused predominantly on mental health outcomes, such as symptoms of anxiety and depression, and rarely on activity-related outcomes, such as physical activity and social role performance (Bohlmeijer, Prenger, Tall, & Cuijpers, 2010; Keng, Smoski, & Robins, 2011; Chiesa & Serretti, 2011). As a result, there is little evidence that mindfulness-based approaches can change behavior patterns in ways that translate into improved physical and social functioning. Certainly, existing evidence for such changes in people with chronic pain could be strengthened (e.g., Astin, Berman, Bausell, Lee, & Hochberg, 2003; Schmidt et al., 2011; Morone, Greco, & Weiner, 2008).

It may enhance the overall effect of mindfulness methods, and help produce results of greater practical importance, to combine these methods with methods that more directly aim to improve engagement in wider patterns of

daily activity. There are examples of treatment approaches that do this. One of these is dialectical behavior therapy (DBT; Linehan, 1993). As far as we know, there are no controlled trials of DBT for chronic pain, even though the methods appears appropriate and feasible (Linton, 2010). The other approach that blends mindfulness-related processes and direct behavior change methods is ACT (McCracken, 2013).

Suggestions for Progress

Continuing development of psychological treatments for chronic pain is like a journey, a journey that requires guidance. One source of guidance emerges from evidence, but guidance cannot come from evidence alone. Even the process of obtaining evidence requires guidance. Research questions typically require a theoretical foundation so that they are systematic and organized, so that one development leads to the next, and so that one does not keep walking over the same old ground. We highlight three strategic choices here that might facilitate the development of CBT for chronic pain. We suggest that researchers and clinicians interested in chronic pain (a) let go of unproductive ideas, (b) adopt a clear scientific philosophy, and (c) develop treatment methods linked to treatment processes and a unified theoretical model.

Letting Go

One of the potential problems with clinical psychology is that the activities of researchers and clinicians are themselves part of the subject matter they are studying and treating (Hayes, 2005; Vilardaga, Hayes, Levin, & Muto, 2009). There are many possible influences on choices made for research questions, key variables of interest, theories adopted, and methods used, and some of these may offer little potential for development. This is not a new idea; outdated, discredited, and unproductive ideas and practices often continue within psychology even when they are known by experts to be of little value (Norcross, Koocher, & Garofalo, 2006). The greater problem, though, involves the many approaches that are not obviously “psychoquackery,” to use Norcross et al.’s term. These include, in particular, approaches that provided an advance in research or treatment in the past but have perhaps outlived their usefulness.

There are a number of key concepts in CBT for chronic pain that were pivotal in their time. These concepts include coping, self-management, and self-efficacy, among others. To a degree, these concepts are common sense. If one has great difficulties, one needs to learn to cope more effectively. If doctors cannot help, one must learn to manage without them. If one is discouraged in reaching goals, one ought to think confidently. These concepts have enjoyed great popularity and persistence, likely due to their strong intuitive appeal. At the same time, we humbly suggest, they have stopped promoting progress. Each tends to frame the problem of chronic pain too narrowly, particularly if followed exclusively. They are missing coherent links with active programs of applied and basic research,

and most important, they are not producing new treatment methods.

Psychological flexibility is not common sense. It includes complex processes in the interaction of verbal and nonverbal influences on the coordination of behavior. It is linked to active programs of basic and applied research. Here it is not just what one thinks or feels that matters but the historical and situational context around what one thinks and feels. This added layer of analysis seems more consistent with the complexity of human behavior problems.

Philosophy of Science and Scientific Strategy

Scientific activity can be disorganized and inefficient unless it is guided by carefully chosen and stated goals, definitions of terms, and philosophical assumptions. For example, the philosophy behind ACT, as mentioned earlier, is functional contextualism. ACT is primarily defined not as a set of techniques but by its adherence to this philosophy and its focus on enhancing psychological flexibility (Hayes et al., 2012). This philosophy defines the subject matter, model of causality, and epistemological assumptions that one would follow in building a knowledge base around this approach. These, in turn, have direct implications for the behavior of the researcher and clinician. For example, the goal of functional contextualism is to create a comprehensive scientific account of behavior that allows prediction and influence (Hayes, 1993). *Behavior* here is explicitly defined as the activity of the whole organism in a situational and historical context. Functional contextualism's methods are mostly inductive. Its truth criterion is successful goal achievement.

From each of the philosophical assumptions of ACT, actions are clear: The dependent variable is always behavior in context, potential processes for study are abstracted from patterns of observed behavior, the independent variables within its analyses must be manipulable in principle to meet the goal of influence, and the analyses must proceed until the goal of the analyses is achieved, that being the capacity to influence the events under investigation. The abstracted principles thus supported are then built into a wider comprehensive account that aims to achieve *precision, scope, and depth*; in other words, the account is specific in its application, wide in the range of psychological problems to which it applies, and consistent with other levels of analysis, such as biology, neurology, physics, and so forth (Hayes et al., 2012; Vilardaga et al., 2009).

Linking Method, Process, and a Unified Theoretical Model

There is "nothing so practical as a good theory" are the oft-quoted words of Kurt Lewin (1952, p. 169). The practical part of a good theory lies in its ability to integrate and organize observations, so that the behavior of researchers and clinicians might be integrated and organized with them and, importantly, remain open to updating as new findings emerge (Hayes, 2005; Vilardaga et al., 2009).

It is quite difficult to pin down the theory or theories behind current psychological treatments for chronic pain,

including CBT, and this leads to several problems. There are many different treatments, some are based on theoretical models and some are not, and the current view is that no one model seems to explain most of these (Jensen, 2011). It has been argued that if no one theoretical model encompasses all treatments, and if each treatment only targets finite subsets of psychological factors, then any choice of theory will exclude some of these factors and could result in suboptimal treatment for some patients (Jensen, 2011). In fact, sometimes different treatments with distinctly different theoretical frameworks are combined within the same treatment packages in an attempt to be comprehensive (Eccleston et al., 2009), and this creates its own problems. A risk in this bewildering situation, in addition to the possibility of suboptimal treatment, is that researchers and clinicians will either dismiss the importance of theory out of frustration or simply follow no particular theory. In either case their behavior may become disorganized.

Just as there are an ever-growing number of new psychological treatments for chronic pain, so too there are an ever-growing number of new psychological variables and related data. Mature theories, however, provide a basis for integrating current findings into a smaller number of broader principles (Hayes, 2005). As mentioned, evidence alone is not enough to progress a field, just as science is not merely the accumulation of facts. It is better if facts are organized and cohere around a finite number of core principles. This is practical.

Despite the constant generation of new variables within studies of chronic pain, including various thinking patterns or beliefs, it seems that none of these have yet led to a single new treatment strategy or method. On the other hand, as far as we can identify, there has not been a single new process or variable generated within ACT since its six-part model was first outlined in the mid-1990s. And yet while ACT is economical in the generation of new variables, it is relatively prolific in generating a wide range of new methods and in consciously incorporating old ones (Brown et al., 2011). It is also prolific in applying itself to increasingly diverse behavior problems, some would say disproportionately so given its relatively recent appearance. It has been documented that in just three selected journals, *Journal of Consulting and Clinical Psychology*, *Behaviour Research and Therapy*, and *Behavior Therapy*, in the years since the publication of the first book on ACT, there have been RCT results published addressing at least 18 different psychological problem areas, including psychosis, diabetes, chronic pain, work stress, depression, substance abuse, smoking, trichotillomania, prejudice and stigma of several kinds, and obsessive-compulsive disorder, among others (Hayes et al., 2012).

Conclusions

Traditional CBT for chronic pain has been very successful in many ways. It is familiar to patients, treatment providers, and funding bodies. It is widely regarded as effective, and its key concepts are a part of the established discourse on

chronic pain. On the other hand, if we measure the success of traditional CBT for chronic pain according to the rate at which it has produced new and more effective treatment methods, success has been more modest.

Our overarching purpose here was to identify a potential pathway for progress for psychological treatments for chronic pain. It is appropriate that this process both actively recognize the successes of the past and embrace the areas where progress is insufficient. These areas include in particular the identification of therapy process and, perhaps more important, the explicit linking of theoretical assumptions, therapy processes, and clinical technique. Buoyed by early success in the treatment of chronic pain, CBT may have become firm on method and loose on process. We advocate reversing this so that research and treatment development are more firm on process and loose on method. In presenting ACT specifically and CCBT more broadly as potential routes toward progress, we call not so much for a shift in treatment techniques but for a shift in the process of development.

We have suggested a three-step process of development: (a) Let go of variables and processes that have ceased to be useful guides for research and treatment development, (b) choose scientific goals and philosophical assumptions, and (c) begin treatment development guided by process and theory. The matter of choosing goals and philosophical assumptions may be a subtle one. A difference may be as small as a shift from seeking to *understand the reality of the world* to seeking ways to *act successfully in the world*. In any case, our three-part recommendation is not miles away from the “accept, choose, and take action” of ACT.

REFERENCES

- Astin, J. A., Berman, B. M., Bausell, B., Lee, W., & Hochberg, M. (2003). The efficacy of mindfulness meditation plus qigong movement therapy in the treatment of fibromyalgia: A randomized controlled trial. *The Journal of Rheumatology, 30*, 2257–2262.
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*, 125–143. doi:10.1093/clipsy.bpg015
- Bohlmeijer, E., Prenger, R., Tall, E., & Cuijpers, P. (2010). The effects of mindfulness-based stress reduction therapy on mental health of adults with a chronic medical disease: A meta-analysis. *Journal of Psychosomatic Research, 68*, 539–544. doi:10.1016/j.jpsychores.2009.10.005
- Brown, L. A., Gaudiano, B. A., & Miller, I. W. (2011). Investigating the similarities and differences between practitioners of second- and third-wave cognitive-behavioral therapies. *Behavior Modification, 35*, 187–200. doi:10.1177/0145445510393730
- Buhrman, M., Skoglund, A., Hussell, J., Bergström, K., Gordh, T., Hursti, T., . . . Andersson, G. (2013). Guided internet-delivered acceptance and commitment therapy for chronic pain patients: A randomized controlled trial. *Behaviour Research and Therapy, 51*, 307–315. doi:10.1016/j.brat.2013.02.010
- Burns, D. D., & Spangler, D. L. (2001). Do changes in dysfunctional attitudes mediate changes in depression and anxiety in cognitive behavioral therapy? *Behavior Therapy, 32*, 337–369. doi:10.1016/S0005-7894(01)80008-3
- Burns, J. W., Kubilus, A., Bruehl, S., Harden, R. N., & Lofland, K. (1998). Do changes in cognitive factors influence outcome following multidisciplinary treatment for chronic pain? *Journal of Consulting and Clinical Psychology, 71*, 81–91. doi:10.1037/0022-006X.66.2.434
- Carmody, J., & Baer, R. A. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine, 31*, 23–33. doi:10.1007/s10865-007-9130-7
- Chiesa, A., & Serretti, A. (2011). Mindfulness-based interventions for chronic pain: A systematic review. *Journal of Alternative and Complementary Medicine, 17*, 83–93. doi:10.1089/acm.2009.0546
- Curran, C., Williams, A. C. de C., & Potts, H. W. W. (2009). Cognitive-behavioral therapy for persistent pain: Does adherence after treatment affect outcome? *European Journal of Pain, 13*, 178–188. doi:10.1016/j.ejpain.2008.06.009
- Dahl, J., Wilson, K. G., & Nilsson, A. (2004). Acceptance and commitment therapy and the treatment of persons at risk for long-term disability resulting from stress and pain symptoms: A preliminary randomized trial. *Behavior Therapy, 35*, 785–801. doi:10.1016/S0005-7894(04)80020-0
- David, D., & Montgomery, G. H. (2011). The scientific status of psychotherapies: A new evaluative framework for evidence-based psychosocial interventions. *Clinical Psychology: Science and Practice, 18*, 89–99. doi:10.1111/j.1468-2850.2011.01239.x
- Dimidjian, S., Hollon, S. D., Dobson, K. S., Schmalzing, K. B., Kohlenberg, R. J., Addis, M. E., . . . Jacobson, N. S. (2006). Randomized trial of behavioral activation, cognitive therapy, and antidepressant medication in the acute treatment of adults with major depression. *Journal of Consulting and Clinical Psychology, 74*, 658–670. doi:10.1037/0022-006X.74.4.658
- Eccleston, C., Williams, A. C., & Morley, S. (2009). Psychological therapies for the management of chronic pain (excluding headache) in adults. *Cochrane Database of Systematic Reviews, 2009*(2). Article No. CD007407. doi:10.1002/14651858.CD007407.pub2
- Fordyce, W. E. (1976). *Behavioral methods for chronic pain and illness*. Saint Louis, MO: C.V. Mosby.
- Garratt, G., Ingram, R. E., Rand, K. L., & Sawalani, G. (2007). Cognitive processes in cognitive therapy: Evaluation of the mechanisms of change in the treatment of depression. *Clinical Psychology: Science and Practice, 14*, 224–239. doi:10.1111/j.1468-2850.2007.00081.x
- Gatchel, R. J., & Okifuji, A. (2006). Evidence-based scientific data documenting the treatment and cost-effectiveness of comprehensive pain programs for chronic non-malignant pain. *The Journal of Pain, 7*, 779–793. doi:10.1016/j.jpain.2006.08.005
- Gaudiano, B. (2011). A review of acceptance and commitment therapy (ACT) and recommendations for continued scientific advancement. *The Scientific Review of Mental Health Practice, 8*, 5–22.
- Goubert, L., Crombez, G., Eccleston, C., & Devulder, J. (2004). Distraction from chronic pain during a pain-inducing activity is associated with greater post-activity pain. *Pain, 110*, 220–227. doi:10.1016/j.pain.2004.03.034
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research, 57*, 35–43. doi:10.1016/S0022-3999(03)00573-7
- Guzmán, J., Esmail, R., Karjalainen, K., Malmivaara, A., Irvin, E., & Bombardier, C. (2001). Multidisciplinary rehabilitation for chronic low back pain: Systematic review. *BMJ: British Medical Journal, 322*, 1511–1516. doi:10.1136/bmj.322.7301.1511
- Haefel, G. J. (2010). When self-help is no help: Traditional cognitive skills training does not prevent depressive symptoms in people who ruminate. *Behaviour Research and Therapy, 48*, 152–157. doi:10.1016/j.brat.2009.09.016
- Hayes, S. C. (1993). Analytic goals and the varieties of scientific contextualism. In S. C. Hayes, L. J. Hayes, H. W. Reese, & T. R. Sarbin (Eds.), *Varieties of scientific contextualism* (pp. 11–27). Reno, NV: Context Press.
- Hayes, S. C. (2005). Eleven rules for a more successful clinical psychology. *Journal of Clinical Psychology, 61*, 1055–1060. doi:10.1002/jclp.20136
- Hayes, S. C., Barnes-Holmes, D., & Roche, B. (2001). *Relational frame theory: A post-Skinnerian account of human language and cognition*. New York, NY: Kluwer Academic/Plenum.
- Hayes, S. C., Follette, V. M., & Linehan, M. M. (2004). *Mindfulness and acceptance: Expanding the cognitive-behavioral tradition*. New York, NY: Guilford Press.

- Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York, NY: Guilford Press.
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2012). *Acceptance and commitment therapy: The process and practice of mindful change*. New York, NY: Guilford Press. doi:10.1177/0011000012460836
- Hayes, S. C., Villatte, M., Levin, M., & Hildebrandt, M. (2011). Open, aware, and active: Contextual approaches as an emerging trend in the behavioral and cognitive therapies. *Annual Review of Clinical Psychology*, 7, 141–168. doi:10.1146/annurev-clinpsy-032210-104449
- Hoffman, B. M., Papas, R. K., Chatkoff, D. K., & Kerns, R. D. (2007). Meta-analysis of psychological interventions for chronic low back pain. *Health Psychology*, 26, 1–9. doi:10.1037/0278-6133.26.1.1
- Hofmann, S. G., & Asmundson, G. J. (2008). Acceptance and mindfulness-based therapy: New wave or old hat? *Clinical Psychology Review*, 28, 1–16. doi:10.1016/j.cpr.2007.09.003
- Jarrett, R. B., Vittengl, J. R., Doyle, K., & Clark, L. A. (2007). Changes in cognitive content during and following cognitive therapy for recurrent depression: Substantial and enduring, but not predictive of change in depressive symptoms. *Journal of Consulting and Clinical Psychology*, 75, 432–446. doi:10.1037/0022-006X.75.3.432
- Jensen, M. P. (2011). Psychosocial approaches to pain management: An organizational framework. *Pain*, 152, 717–725. doi:10.1016/j.pain.2010.09.002
- Jensen, M. P., Turner, J. A., & Romano, J. M. (2001). Changes in beliefs, catastrophizing, and coping are associated with improvement in multidisciplinary pain treatment. *Journal of Consulting and Clinical Psychology*, 69, 655–662. doi:10.1037/0022-066X.69.4.655
- Jensen, M. P., Turner, J. A., & Romano, J. M. (2007). Changes after multidisciplinary pain treatment in patients' pain beliefs and coping are associated with concurrent changes in patient functioning. *Pain*, 131, 38–47. doi:10.1016/j.pain.2006.12.007
- Johnston, M., Foster, M., Shennan, J., Starkey, N. J., & Johnson, A. (2010). The effectiveness of an acceptance and commitment therapy self-help intervention for chronic pain. *The Clinical Journal of Pain*, 26, 393–402. doi:10.1097/AJP.0b013e3181cf59ce
- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York, NY: Dell.
- Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology*, 3, 1–27. doi:10.1146/annurev.clinpsy.3.022806.091432
- Keng, S. L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*, 31, 1041–1056. doi:10.1016/j.cpr.2011.04.006
- Levin, M. E., Hildebrandt, M. J., Lillis, J., & Hayes, S. C. (2012). The impact of treatment components suggested by the psychological flexibility model: A meta-analysis of laboratory-based component studies. *Behavior Therapy*, 43, 741–756. doi:10.1016/j.beth.2012.05.003
- Lewin, K. (1952). *Field theory in social science: Selected theoretical papers by Kurt Lewin*. London, England: Tavistock.
- Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York, NY: Guilford Press.
- Linton, S. J. (2010). Applying dialectical behavior therapy to chronic pain: A case study. *Scandinavian Journal of Pain*, 1, 50–54. doi:10.1016/j.sjpain.2009.09.005
- Longmore, R. J., & Worrell, M. (2007). Do we need to challenge thoughts in cognitive behavior therapy? *Clinical Psychology Review*, 27, 173–187.
- Masedo, A. I., & Esteve, M. R. (2007). Effects of suppression, acceptance and spontaneous coping on pain tolerance, pain intensity and distress. *Behaviour Research and Therapy*, 45, 199–209. doi:10.1016/j.brat.2006.02.006
- McCracken, L. M. (2005). *Contextual cognitive-behavioral therapy for chronic pain*. Seattle, WA: IASP Press.
- McCracken, L. M. (2013). Committed action: An application of the psychological flexibility model to activity patterns in chronic pain. *The Journal of Pain*, 14, 828–835. doi:10.1016/j.jpain.2013.02.009
- McCracken, L. M., & Gutiérrez-Martínez, O. (2011). Processes of change in psychological flexibility in an interdisciplinary group-based treatment for chronic pain based on acceptance and commitment therapy. *Behaviour Research and Therapy*, 49, 267–274. doi:10.1016/j.brat.2011.02.004
- McCracken, L. M., Vowles, K. E., & Eccleston, C. (2005). Acceptance-based treatment for persons with complex longstanding chronic pain: A preliminary analysis of treatment outcome in comparison to a waiting phase. *Behaviour Research and Therapy*, 43, 1335–1346. doi:10.1016/j.brat.2004.10.003
- Morley, S., Eccleston, C., & Williams, A. (1999). Systematic review and meta-analysis of randomized controlled trials of cognitive behaviour therapy and behaviour therapy for chronic pain in adults, excluding headache. *Pain*, 80, 1–13. doi:10.1016/S0304-3959(98)00255-3
- Morley, S., & Keefe, F. J. (2007). Getting a handle on process and change in CBT for chronic pain. *Pain*, 127, 197–198. doi:10.1016/j.pain.2006.10.025
- Morone, N. E., Greco, C. M., & Weiner, D. K. (2008). Mindfulness meditation for the treatment of chronic low back pain in older adults: A randomized controlled pilot study. *Pain*, 134, 310–319. doi:10.1016/j.pain.2007.04.038
- Murphy, R., Cooper, Z., Hollon, S. D., & Fairburn, C. G. (2009). How do psychological treatments work? Investigating mediators of change. *Behaviour Research and Therapy*, 47, 1–5. doi:10.1016/j.brat.2008.10.001
- Norcross, J. C., Koocher, G. P., & Garofalo, A. (2006). Discredited psychological treatments and tests: A Delphi poll. *Professional Psychology: Research and Practice*, 37, 515–522. doi:10.1037/0735-7028.37.5.515
- Öst, L. G. (2008). Efficacy of the third wave of behavioral therapies: A systematic review and meta-analysis. *Behaviour Research and Therapy*, 46, 296–321. doi:10.1016/j.brat.2007.12.005
- Powers, M. B., Zum Vörde Sive Vörding, M. B., & Emmelkamp, P. M. (2009). Acceptance and commitment therapy: A meta-analytic review. *Psychotherapy and Psychosomatics*, 78(2), 73–80. doi:10.1159/000190790
- Rosenzweig, S., Greeson, J. M., Reibel, D. K., Green, J. S., Jasser, S. A., & Beasley, D. (2010). Mindfulness-based stress reduction for chronic pain conditions: Variations in treatment outcomes and role of home meditation practice. *Journal of Psychosomatic Research*, 68, 29–36. doi:10.1016/j.jpsychores.2009.03.010
- Ruiz, F. J. (2010). A review of acceptance and commitment therapy (ACT) empirical evidence: Correlational, experimental psychopathology, component and outcome studies. *International Journal of Psychology & Psychological Therapy*, 10, 125–162.
- Scascighini, L., Toma, V., Dober-Spielmann, S., & Sprott, H. (2008). Multidisciplinary treatment for chronic pain: A systematic review of interventions and outcomes. *Rheumatology*, 47, 670–678. doi:10.1093/rheumatology/ken021
- Schmidt, S., Grossman, P., Schwarzer, B., Jena, S., Naumann, J., & Walach, H. (2011). Treating fibromyalgia with mindfulness-based stress reduction: Results from a 3-armed randomized controlled trial. *Pain*, 152, 361–369. doi:10.1016/j.pain.2010.10.043
- Schulte, D., & Eifert, G. H. (2002). What to do when manuals fail? The dual model of psychotherapy. *Clinical Psychology: Science and Practice*, 9, 312–328. doi:10.1093/clipsy.9.3.312
- Severeijns, R., van den Hout, M. A., & Vlaeyen, J. W. S. (2005). The causal status of pain catastrophizing: An experimental test with healthy participants. *European Journal of Pain*, 9, 257–265. doi:10.1016/j.ejpain.2004.07.005
- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, 62, 373–386. doi:10.1002/jclp.20237
- Smeets, R. J. E. M., Vlaeyen, J. W. S., Kester, A. D. M., & Knottnerus, J. A. (2006). Reduction of pain catastrophizing mediates the outcome of both physical and cognitive behavioral treatment in chronic low back pain. *The Journal of Pain*, 7, 261–271. doi:10.1016/j.jpain.2005.10.011
- Society of Clinical Psychology, American Psychological Association, Division 12. *Acceptance and commitment therapy for chronic pain*. Retrieved from http://www.div12.org/PsychologicalTreatments/treatments/chronicpain_act.html
- Stice, E., Rohde, P., Seely, J. R., & Gau, J. M. (2010). Testing mediators of intervention effects in randomized controlled trials: An evaluation of three depression prevention programs. *Journal of Consulting and Clinical Psychology*, 78, 273–280. doi:10.1037/a0018396

- Sullivan, M. J., Rouse, D., Bishop, S., & Johnston, S. (1997). Thought suppression, catastrophizing, and pain. *Cognitive Therapy and Research, 21*, 555–568. doi:10.1023/A:1021809519002
- Thorsell, J., Finnes, A., Dahl, J., Lundgren, T., Gybrant, M., Gordh, T., & Buhrman, M. (2011). A comparative study of 2 manual-based self-help interventions, acceptance and commitment therapy and applied relaxation, for persons with chronic pain. *The Clinical Journal of Pain, 27*, 716–723. doi:10.1097/AJP.0b013e318219a933
- Turk, D. C., & Burwinkle, T. M. (2005). Clinical outcomes, cost-effectiveness, and the role of psychology in treatments for chronic pain sufferers. *Professional Psychology: Research and Practice, 36*, 602–610. doi:10.1037/0735-7028.36.6.602
- Turk, D. C., Meichenbaum, D., & Genest, M. (1983). *Pain and behavioral medicine: A cognitive-behavioral perspective*. New York, NY: Guilford Press.
- Veehof, M. M., Oskam, M. J., Schreurs, K. M. G., & Bohlmeijer, E. T. (2011). Acceptance-based interventions for the treatment of chronic pain: A systematic review and meta-analysis. *Pain, 152*, 533–542. doi:10.1016/j.pain.2010.11.002
- Villardaga, R., Hayes, S. C., Levin, M. E., & Muto, T. (2009). Creating strategy for progress: A contextual behavioral science approach. *The Behavior Analyst, 32*, 105–133.
- Vowles, K. E., & McCracken, L. M. (2008). Acceptance and values-based action in chronic pain: A study of treatment effectiveness and process. *Journal of Consulting and Clinical Psychology, 76*, 397–407. doi:10.1037/0022-006X.76.3.397
- Vowles, K. E., & McCracken, L. M. (2010). Comparing the role of psychological flexibility and traditional pain management coping strategies in chronic pain treatment outcomes. *Behaviour Research and Therapy, 48*, 141–146. doi:10.1016/j.brat.2009.09.011
- Vowles, K. E., McCracken, L. M., & Eccleston, C. (2007). Processes of change in treatment for chronic pain: The contributions of pain, acceptance, and catastrophizing. *European Journal of Pain, 11*, 779–787.
- Vowles, K. E., McCracken, L. M., & Zhao-O'Brien, J. (2011). Acceptance and values-based action in chronic pain: A three year follow-up analysis of treatment effectiveness and process. *Behaviour Research and Therapy, 49*, 748–755. doi:10.1016/j.brat.2011.08.002
- Vowles, K. E., Wetherell, J. L., & Sorrell, J. T. (2009). Targeting acceptance, mindfulness, and values-based action in chronic pain: Findings of two preliminary trials of an outpatient group-based intervention. *Cognitive and Behavioral Practice, 16*, 49–58. doi:10.1016/j.cbpra.2008.08.001
- Waller, G. (2009). Evidence-based treatment and therapist drift. *Behaviour Research and Therapy, 47*, 119–127. doi:10.1016/j.brat.2008.10.018
- Wetherell, J. L., Afari, N., Rutledge, T., Sorrell, J. T., Stoddard, J. A., Petkus, A. J., . . . Atkinson, J. H. (2011). A randomized, controlled trial of acceptance and commitment therapy and cognitive-behavioral therapy for chronic pain. *Pain, 152*, 2098–2107. doi:10.1016/j.pain.2011.05.016
- Wicksell, R. K., Ahlqvist, J., Bring, A., Melin, L., & Olsson, G. (2008). Can exposure and acceptance strategies improve functioning and life satisfaction in people with chronic pain and whiplash-associated disorders (WAD)? A randomized controlled trial. *Cognitive Behaviour Therapy, 37*, 169–182. doi:10.1080/16506070802078970
- Wicksell, R. K., Kemani, M., Jensen, K., Kosek, E., Kadetoff, D., Sorjonen, K., . . . Olsson, G. L. (2012). Acceptance and commitment therapy for fibromyalgia: A randomized controlled trial. *European Journal of Pain, 17*, 599–611. doi:10.1002/j.1532-2149.2012.00224.x
- Wicksell, R. K., Olsson, G. L., & Hayes, S. C. (2010). Psychological flexibility as a mediator of improvement in acceptance and commitment therapy for patients with chronic pain following whiplash. *European Journal of Pain, 14*, 1059.e1.e11599–1059. doi:10.1016/j.ejpain.2010.05.001
- Woby, S. R., Watson, P. J., Roach, N. K., & Urmston, M. (2004). Are changes in fear-avoidance beliefs, catastrophizing, and appraisals of control, predictive of changes in chronic low back pain and disability? *European Journal of Pain, 8*, 201–210. doi:10.1016/j.ejpain.2003.08.002
- Wood, J. V., Perunovic, E. W. Q., & Lee, W. M. (2009). Positive self-statements: Power for some, peril for others. *Psychological Science, 20*, 860–866. doi:10.1111/j.1467-9280.2009.02370.x