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Cold pressor: acceptance, control and expectations

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Abstract

To begin to examine how non-specific therapy factors, in particular expectations, may impact on treatment outcomes for Acceptance and Commitment Therapy for the treatment of chronic pain, an investigative analogue study was conducted; completed by Psychology undergraduates from the University of Plymouth (N=52). This study re-examined the effectiveness of Acceptance and Control-based instructions on cold pressor pain; but extended this to explore whether high or low expectations of these strategies impacts their effectiveness. Participants were exposed to a cold pressor task to determine baseline tolerance, followed by a Short-form McGill Pain Questionnaire (SF-MPQ). Control or Acceptance-based instructions, with an embedded high or low expectation manipulation were provided; followed by an adapted SF-MPQ to record participants' expectations regarding their treatment strategy for completing a cold pressor task. Participants completed a subsequent cold pressor under their treatment conditions, and a final SF-MPQ. A series of analyses of covariance were conducted. Contrary to previous studies, neither the acceptance nor control instructions were found to be superior for either pain tolerance or self-reported pain, supporting the common factors debate. In addition it was found that expectations were successfully manipulated; however expectations were not found to significantly impact upon outcomes, suggesting that expectations regarding ACT and CBT may be malleable, and have potential to be maximised to benefit treatment. However, future research, in clinical populations, is needed to explore the mechanisms by which expectations operate to determine whether expectations of ACT or CBT can indeed impact on treatment outcomes. Implications and limitations are discussed.

Introduction

Chronic pain is a major health problem; this condition presents as not only physical, but it also has a wider psychological and social impact, and has been shown to have devastating effects on many domains of a sufferer's life (McCracken, 1998). Approximately 10 million people in the UK suffer from chronic pain (Emerson, 2012), and pain is one of the primary symptoms that lead people to seek professional treatment (Stucky, Gold & Zhang, 2001). However, the condition is still not fully understood; in most cases patients are highly medicated or referred for surgery, both of these are expensive, often have little success, and can have detrimental side effects (McCracken, 2005). Most commonly, when all medical alternatives have been exhausted, psychological therapies are pursued (McCracken, 2005). For some, there will not be a medical treatment that leads reliably to clinically significant pain relief, and therefore it is important to provide an alternative psychological therapy to assist those individuals who do not improve with traditional medical treatment, in order to address maladaptive thoughts, feelings and behaviours associated with chronic pain (Vowles & Thompson, 2011).

Research provides strong evidence that psychological interventions can be effective in pain management (Veehof, Oskam, Schreurs, & Bohlmeijer, 2011), at present there are two psychotherapies at the forefront of pain management intervention: Acceptance and Commitment therapy (ACT) (Luoma, Hayes & Walser, 2007) and Cognitive Behavioural Therapy (CBT) (Butler, Chapman, Forman, & Beck, 2006). ACT is a therapeutic model that is part of the "third wave" in behavioural and cognitive therapy which emphasizes processes such as mindfulness and acceptance in helping people overcome obstacles in their lives (Hayes, 2004). These strategies are used with the intention of improving psychological flexibility, which can be described broadly as being able to hold our own thoughts and emotions more lightly to enable us to live a values-led life (Luoma, Hayes & Walser, 2007). Specifically, in relation to chronic pain, ACT is used with the aim to reduce the impact of pain on people's lives, allowing them to return to activities that are important to them (Dahl, Wilson, Luciano & Hayes, 2005).

This way of reacting to pain, or other types of suffering, can be contrasted to what is often the more natural response, whereby people may try to eliminate negative thoughts and feelings, for example, the suppression of unwanted thoughts, avoidance of uncomfortable feelings, or distraction away from current experience; in summary, a control based approach (Vowles & McCracken, 2010). This style of reacting to pain is often encouraged in Cognitive Behavioural Therapy (CBT); traditional CBTs have developed and taught strategies for changing and altering unwanted psychological events (Keogh, 2004). As previously noted, ACT differs from traditional CBT in that rather than trying to teach people to better control their thoughts, feelings, sensations, memories and other private events, ACT teaches them to "just notice", accept, and embrace them (Dahl et al. 2005).

These two forms of psychotherapy are now widely implemented (Kerns, Sellinger & Goodin, 2011), although, CBT has been the prominent form of psychotherapy utilized for many years, and has received more empirical support (Butler et al., 2011). Research has identified that implementing CBT can reduce patients' pain, distress, and pain behaviour, and can improve their daily functioning (McCracken & Turk, 2002); in recent years, however, there has been a surge in empirical studies

examining ACT based practices, which suggest it may also be beneficial (Kohl, Rief, Glombiewski, 2012). Findings indicate that greater acceptance of pain is associated with similar outcomes to that of CBT, such as reports of less pain-related anxiety and avoidance, less depression, less physical and psychosocial disability and more daily uptime (McCracken, 1998): evidenced in both cross-sectional and longitudinal studies (McCracken & Eccleston, 2005). There is clear evidence that both forms of psychotherapy may be effective for the treatment of chronic pain, however there is controversy between supporters of CBT and ACT as to which is more effective, and which should therefore be administered in clinical practice (Ruiz, 2012). There are still questions remaining as to which of these psychotherapeutic practices are superior (Veehof et al., 2011), many studies have now attempted to directly compare the effectiveness of ACT and CBT.

In an early analogue laboratory-based study, Hayes et al. (1999) compared the effects of acceptance-based and control-based interventions on pain induced by a cold-pressor task. The length of time participants voluntarily kept their hands in the cold pressor and subjective evaluations of pain were measured, results identified, when compared with control-oriented strategies, Acceptance-oriented strategies significantly enhanced pain tolerance, but not self-reported responses of pain; the Control-based instructions also increased pain tolerance but not to the same extent. However further extensions of this work have found ACT to be more beneficial than CBT for self-reported responses to the cold pressor; whilst it failed to identify any benefits for pain tolerance (Keough, Bond, Hanmer, & Tilston, 2005), this may merely be a result of inconsistencies in methodologies and measurements.

However, inconsistencies can be seen when comparing ACT and CBT when implemented in clinical populations. Vowles et al. (2007) conducted a study with individuals suffering from chronic lower back pain, and investigated the effects of three sets of instructions on a physical impairment assessment: pain control, pain acceptance and continued practice (control group). Using an analogue experimental design, results indicated that performance improved more following instructions emphasizing aspects of acceptance, in comparison to instructions based on pain control strategies. However, in a study where patients with chronic pain were randomly assigned to group sessions of ACT or CBT, and then assessed after treatment and at 6-month follow-up, findings indicated that there were no significant differences in improvement between the treatment conditions for patients on any outcome variables, such as pain interference and mood (Wetherell et al., 2011). In addition, a recent meta-analysis and systematic review examined controlled and non-controlled studies that had reported effects of Acceptance-based or Control-based therapies for the treatment of chronic pain. The findings indicated that ACT and CBT may be equally effective; Acceptance-based therapies were shown to have small to medium effects on physical and mental health in chronic pain patients that were comparable to that of CBT (Veehof et al., 2011).

The findings from research comparing ACT and CBT are inconsistent, and as both are now commonly implemented in clinical settings, not only for chronic pain but for many psychological and health disorders (Ruiz, 2012), it is especially important to question results indicating that they may be equal in their effectiveness. These findings may have important consequences for clinical practice, as they point to a fundamental question, and an on-going debate in the field of psychotherapy research

- the 'common' versus 'specific' factors debate (Wampold, 2001). Researchers and clinicians alike have long been aware of the common factor model and 'non-specific therapy effects.'(Rozenweig, 1936, cited in Wampold, 2001). This model proposes that there are dimensions which are common to most therapies, and these common factors are responsible for the benefits of psychotherapy, rather than ingredients specific to a particular therapy. Dimensions such as the healing context, expectations, therapist characteristics, and development of relationships are regarded as common factors (Frank & Frank, 1991, cited in Wampold, 2001), and it is believed these common factors, among others, are why many psychotherapy treatments are virtually equivalent in terms of their benefits (Ahn & Wampold, 2001).

However, there is still controversy surrounding the relative size of general and specific effects; the medical model/specific factor model of psychotherapy argues that specific ingredients are more important (DeRubeis, Brotman, & Gibbons, 2005), however, research supporting the contextual/common factor model indicates that general factors may account for a significant portion of the variance in therapeutic outcomes, some have argued as much as 70% (Wampold, 2007). Methodological biases, and ignoring these common factors, is therefore believed to have led to overestimations of specific treatment effects (Wampold, 2001), and continued research on specific ingredients in psychotherapy will still support this general pattern of results, but yield little informative evidence, suggesting the focus of research should be on the common factors that have historically been overlooked (Ahn & Wampold, 2001).

There has been some slow progression toward making these 'non-specific factors' specific, so that they can be identified and maximised to help enhance therapeutic effectiveness (DeFife & Hilsenroth, 2011); however these concepts are still largely neglected in much research on psychotherapeutic practices (Wampold, 2001). One important common dimension which is considered to be notably unappreciated (Constantino, Arnkoff, Glass, Ametrano & Smith, 2011), and has previously been referred to as the 'ignored common factor', is patient expectations (Weinberger & Eig, 1999, cited in Constantino et al., 2011).

Expectations in psychotherapy were historically seen by some as methodological by-products to be controlled for (Dozois & Westra, 2005), however some clinical theorists and researchers have long believed that treatment related expectations are a powerful factor in psychotherapy treatment (Frank, 1961; Goldfried, 1980, as cited in Constantino, 2012). Classically, Frank (1961, as cited in Constantino 2011) supposed that for psychotherapy to be effective there must be hope within patients, that expectations were a powerful change ingredient, and over 20 years ago Kirsch (1990) identified 'response expectancies,' which he defined as the anticipation of automatic, subjective and behavioural responses to a particular behavioural cue. Response expectancies were first discovered as the mechanism behind placebo effects in medical research, and were found to affect a wide variety of responses, including sensations and emotions. However, Kirsch (1990) argued that the effects of response expectancies were not limited to pharmacological treatment and supposed the same expectation response mechanism, by which placebos produce their effects, may be responsible for much of the effectiveness in psychotherapy (Kirsch, 1990). Kirsch (1990) believed response expectations to be an ill-named,

non-specific factor that should be identified to maximise impact on psychological treatment alongside other non-specific factors.

More recently there has been a renewed interest in the expectations construct (Constantino et al, 2011), and currently in the contextual model of psychotherapy; expectations are now widely believed to play an important role in treatment benefit (Constantino, 2012). For some, the expectations of patients are thought to be the crux of virtually all psychotherapy approaches, going so far as to suggest that 'most psychotherapies are inextricably linked with the manipulation and revision of patients' expectations' (Greenberg, Constantino, & Bruce, 2006, p. 671).

Due to this renewed interest in expectancies, much research has now attempted to identify various types of expectations and examine how they may impact on treatment (Constantino et al., 2011). The two major forms of patient expectations are now considered to be: process expectancies, such as role expectations and duration of treatment, and outcome expectations. Outcome expectancies are explored more in the literature and are also of more interest here; these can be explained as a patient's belief that they will benefit from therapy (Constantino, 2011). Outcome expectations are believed to map onto a continuum of very positive to very negative (Goossens, Vlaeyen, Hidding, Kole-Snijders & Evers, 2005), and are thought be affected by context and previous learning experiences (Constantino et al., 2011). Expectations should be differentiated from related, but distinct concepts such as credibility, motivation for treatment, or treatment preference. For example, a patient may be highly motivated, but still think a positive outcome is unlikely (Greenberg et al., 2006).

A considerable number of investigations have now identified that prior expectations of the benefits of a treatment may have an impact on the success of treatment; this has now been identified for a wide range of problems and interventions ranging from treatment for depression (Rutherford, Wager & Roose, 2010), to treatment for social phobia (Safren, Heimberg, & Juster,1997). Furthermore, box count and narrative reviews indicate that outcome expectations are fairly consistently, seen to effect treatment outcomes across a range of psychotherapies such as CBT, psychodynamic, and interpersonal therapies (Greenberg et al., 2006; Noble, Douglas, & Newman, 2001; Constantino, 2012). This has also been supported in recent meta-analysis on outcome expectancies, examining 46 independent clinical samples (Constantino, 2011). Focussing on treatments that were implemented by a psychotherapist, this analysis was based on investigating the associations between pre-therapy/early-therapy outcome expectations, with post-treatment outcomes. This comprehensive meta-analysis demonstrated that there was a small but significant effect; again it was observed that patient's outcome expectations had a positive effect on their treatment outcomes, and it was suggested that, in a clinical setting, patients' expectations should be verified and validated to enhance clinical outcomes by reinforcing realistic positive expectations.

Meta-analyses and studies investigating naturally occurring expectations have therefore shown that expectations can impact on treatment outcomes (Constantino, 2011). Research also indicates those induced in patients by giving them information designed to heighten positive expectations may play a role in outcome of treatment. In an early study (Shaw & Blanchard, 1983), a multi-component stress management

program was administered under two different instructional sets, which were positive or neutral (compared to a waiting list control). Results demonstrated that positive instructions had induced higher expectations of benefit in the positive group, and self-report measures indicated greater improvements in outcome for this group, interestingly those with higher expectations were observed to be more likely to carry out treatment homework, it was suggested that this may be a mechanism through which expectations operate. More recently evidence suggests that when physicians provide clear explanations about symptoms and optimistic predictions about outcomes for minor ailments, this raises patient expectations and leads to better health outcomes (Fassaert, van Dulmen, Schellevis, van der Jagt, & Bensing, 2008), indicating that outcome expectations can be manipulated and maximised to positively affect treatment outcomes.

It is evident that outcome expectations play a role in treatment benefit, but researchers have only recently begun to examine the role of outcome expectations in relation to the treatment of chronic pain; expectations regarding treatment for chronic pain are now thought to be especially salient due to the multidimensional nature of pain as it comprises biological, psychological and social aspects (Gatchel & Turk as cited in Tsao et al., 2005). To examine expectations in relation to chronic pain, a randomized trial studied patients with chronic lower back pain who received either acupuncture or massage treatment. The findings, based on level of function, indicated that patients who had higher expectations for massage rather than acupuncture were more likely to have better outcomes with massage than acupuncture, and vice versa (Kalauokalani, Cherkin, Sherman, Koepsell, & Deyo, 2001), indicating expectations may impact outcomes, independent of the treatment provided. Furthermore, researchers have begun to investigate the influence of expectancy in the treatment of chronic pain when using psychotherapy (Goossens et al., 2005). As aforementioned, for many, psychotherapy for the treatment of chronic pain is offered as last resort (McCracken, 2005). Patients have often contacted many providers to find pain relief, from which outcomes are often unsuccessful and unsatisfactory, potentially reinforcing negative expectations of future treatment before it is experienced (Long & Guite, 2008). Suggesting expectations here may be of particular importance, and this may be an area where treatment benefits could be maximised if expectations could be appropriately managed (Constantino, 2011). A preliminary study has investigated pre-treatment expectations in the treatment of chronic pain when using CBT (Goossens et al., 2005). For all outcomes measured, such as pain coping and quality of life, significant differences were observed. Furthermore, these benefits were not only recognised immediately after treatment, but also at a 12 month follow up, again offering support for the mediating role of expectations, but also indicating that they may have a pervasive, long lasting impact, and that they may indeed play a role when treating chronic pain with CBT.

Outcome expectations have now reliably been shown to impact upon treatment benefit in a wide range of treatments and disorders (Price, Anderson, Henrich & Rothbaum, 2008). However, to date, according to the literature search undertaken, this effect of expectation has not been investigated in relation to ACT, or when using ACT for the treatment of chronic pain. To begin to examine how expectations may impact treatment outcomes, an investigative analogue study was conducted; similar to Hayes (1999) the current study aimed to re-examine the effectiveness of Acceptance and Control-based instructions on cold pressor pain, but extended this

by attempting to manipulate participants' expectations of these treatment rationales, to examine whether high or low expectations of the usefulness of these strategies impacts their effectiveness. To start to explore whether the positive effects of ACT may be mediated by expectancies of benefit and to determine whether this form of therapy would still be as effective if participants didn't have positive outcome expectations.

In line with the common factors debate, and more recent findings from meta-analyses showing equal effectiveness for ACT and CBT (Wampold, 2001; Veehof et al., 2011), it was predicted, contrary to the work of Hayes (1999) and Keough et al., (2005), that neither the acceptance or control intervention would be more beneficial for completing the cold pressor task, or have differing effects on pain responses. But, in addition, after reviewing the literature on outcome expectations, it was anticipated that those with high expectations for either Acceptance or Control instructions would keep their hand immersed longer than those with low expectations, and when controlling for how long participants kept their hand immersed for, it was predicted that participants in the high expectation conditions would report less pain.

Method

Participants

Psychology undergraduates at stage 1, 2 and 4, from The University of Plymouth participated as a compulsory element of the course (N=52). Participants were recruited via a research participation pool, in which points were rewarded for participation. All volunteers were asked if they suffered from any medical condition such as Raynaud's disease, diabetes, high blood pressure, a history of cardiac disorder, or fainting and seizures; which would have prevented participation, due to potential risks associated with exposure to cold water. None of the participants reported any of these conditions. Participants were not screened for the presence of chronic pain conditions.

Materials

A plastic box (measuring 40cm x 30cm x 23cm) that contained 18 litres of ice water at 5 (+/-.5) degree centigrade was used for the cold pressor task. A thermometer was used to measure the water temperature; to help regulate the temperature, and to avoid a warm microenvironment around the hand (Baeyer, Piira, Chambers, Trapanotto, & Zeltzer, 2005), a pump was used to circulate the water. The duration of immersion (pain tolerance) was measured in seconds using a stopwatch. Participants were given standardised spoken instructions for the baseline cold pressor task, a further four sets of instructions were used for the experimental treatment conditions, and baseline instructions were repeated for the no treatment group (NT). The treatment instructions included a small background description, and instructions either consistent with Control-based strategies (CON) or Acceptance-based strategies (ACC). For example, in the ACC condition participants were told to be aware of their thoughts and feelings, but not to change, avoid or control them, whereas the CON instructions told participants to control their thoughts and feelings about the pain. Instructions were written in an attempt to manipulate expectations of the benefit of the treatment condition; participants in high expectation conditions (HI) were told that "accepting/controlling our thoughts and feelings gives good results in

the cold pressor task. Using this strategy of acceptance/control helps people keep their hand in the water for longer; many people find this strategy useful". Conversely participants in the low expectation conditions (LO) were told that, "accepting/controlling our thoughts and feelings does not always help people in the cold pressor task. Using this strategy of acceptance/control does not always help people keep their hand in the water for longer, this strategy is not useful for everybody".

A self-report measure of pain was used; the Short Form McGill Pain Questionnaire (SF-MPQ). The SF-MPQ contains 11 sensory pain descriptors such as throbbing and stabbing and 4 affective pain descriptors for example, sickening and tiring. Each descriptor is given a score between 0 (none) and 3 (severe). The SF-MPQ also has two further measures of pain, present pain intensity (PPI) which is a measure of overall pain intensity, and a visual analogue score (VAS), given by the subjects rating his/her pain experience on a linear scale. For the purpose of the present study only the sensory and affective measures were used. An adapted SF-MPQ was also used which aimed to measure participants expectation; participants were asked to complete the questionnaire as if they had just carried out the task, using their new instructions.

Design and Procedure

A 2 x 2 (ACC/CON x HI/LO) between groups design, with a within group baseline control, and a separate no treatment control group, was employed. Using random number generation on excel, participants were randomly assigned to one of the following five conditions: acceptance-based instructions/high expectations (ACC/HI), acceptance-based instructions/low expectations (ACC/LO), control-based instructions/high expectations (CON/HI), control-based instructions/low expectations (CON/LO), and no treatment group (NT).

Participants were asked to read the brief and consent form which outlined the experiment and provided general instructions about the cold pressor task. Participants were notified of their right to withdraw at any time, with no repercussions, and that their data would remain confidential. Confirmation that the objectives of the research had been explained to them, and that they did not suffer from any condition that would not allow them to participate was obtained with written informed consent, using a standardised consent form.

First standardised spoken instructions for completing the baseline cold pressor test were given, instructions from the experimenter informed participants to remove their hand when they could no longer tolerate the pain (pain tolerance). Participants were asked to remove jewellery, and then immerse their hand into the ice water, placing their hand on the bottom of the box. Participants undertook the test using their non-dominant hand. Immersion was measured in seconds; a maximum safety time limit of 4 minutes was enforced for the immersion of the hand. The participants were not informed of this limit as to try to reduce the risk of competitiveness and to hopefully lessen possible misconceptions that the hand was expected to be in the water for that amount of time (Baeyer et al., 2005). Participants were asked to complete the Short Form McGill Pain Questionnaire (SF-MPQ).

CON/HI, CON/LO, ACC/Hi, ACC/LO or NT instructions were then provided. The expectation manipulation was re-iterated verbally by the experimenter when participants in the ACC and CON treatment groups were asked to complete the adapted SF-MPQ. This was followed by a second cold pressor task, under the new instructions; before participants began, the experimenter verbally reinforced the treatment instructions and expectation manipulation. For this second cold pressor task participants did not re-immerse their non-dominant hand, but instead, used their dominant hand: a cumulative cooling effect of repeated immersion has been demonstrated when hand temperature fails to recover to normal (Mitchell, MacDonald & Brodie, 2004). Time in cold pressor (pain tolerance) was measured in seconds, again a maximum time limit of 4 minutes was enforced which participants were unaware of. Following the cold pressor test, participants were asked again to complete the SF-MPQ. When participants had completed the questionnaire they were provided with a standardised written debrief. Participants were awarded 1 participation point for completing the study. The study took under 30 minutes to complete.

Results

To assess the effects of ACC/CON instructions and HI/LO expectation manipulations, a series of Analyses of Covariance (ANCOVAs) were run examining the outcome measures; cold pressor tolerance, self- reports of pain (SF-MPQ), affective self-reports of pain (AFF-SF-MPQ), and a computed expectation score (expectation SF-MPQ score subtracted from baseline SF-MPQ score) All ANCOVAs were run controlling for pre-treatment scores; models examining self-reported measures of pain (SF-MPQ and AFF-SFMPQ) also included post-treatment tolerance scores as an additional covariate, allowing the examination of self-reported responses controlling for how long people kept their hand immersed for. All analyses were performed using the Statistical Package for Social Sciences (SPSS, Windows version 20).

Cold pressor outcome scores did not meet the assumption of normality; subsequently they were transformed using log transformations. A one way analysis of variance was conducted to determine whether the experimental conditions differed at baseline, conditions did not differ significantly ($P = .607$), it was concluded that randomization was successful. Descriptive statistics for the five experimental groups are given in Table 1, examination of the means indicated that pain tolerance (seconds) increased at post-treatment compared to baseline tolerance for all treated conditions, but not for the no treatment condition. Post-treatment SF-MPQ scores all decreased from baseline SF-MPQ scores for all treated groups, but increased for the no treatment group. The data in Figure 1 indicate that the difference between participants pre-treatment tolerance score and post treatment tolerance score was the larger in the high expectation manipulation conditions, compared to the low expectation conditions, and again displays that the tolerance time for treated conditions (ACC/HI, ACC/LO, CON/HI, CON/LO) increased, but decreased for NT.

Table 1: Means and standard deviations of SF-MPQ total scores and cold pressor tolerance scores (seconds) for the acceptance and control-based instruction groups, under conditions of high and low expectations, and the no treatment group

	Intervention									
	Acceptance				Control				No Treatment	
	High Expectation		Low Expectation		High Expectation		Low Expectation			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Tolerance										
Baseline	29.964	(17.053)	56.9	(58.449)	33.98	(18.887)	65.55	(74.588)	43.291	(44.022)
Post-treatment	47.955	(27.746)	84.1	(79.989)	50.85	(26.378)	75.85	(79.669)	37.591	(37.755)
SF-MPQ score										
Baseline	20.364	(7.632)	17.1	(3.348)	13.8	(4.289)	13.4	(5.358)	14.636	(6.233)
Expectations	10.636	(4.589)	12.7	(3.653)	8.3	(3.945)	9.6	(4.742)		
Post-treatment	13.646	(7.762)	13.1	(5.626)	12.1	(6.064)	10.8	(5.808)	15.636	(7.762)

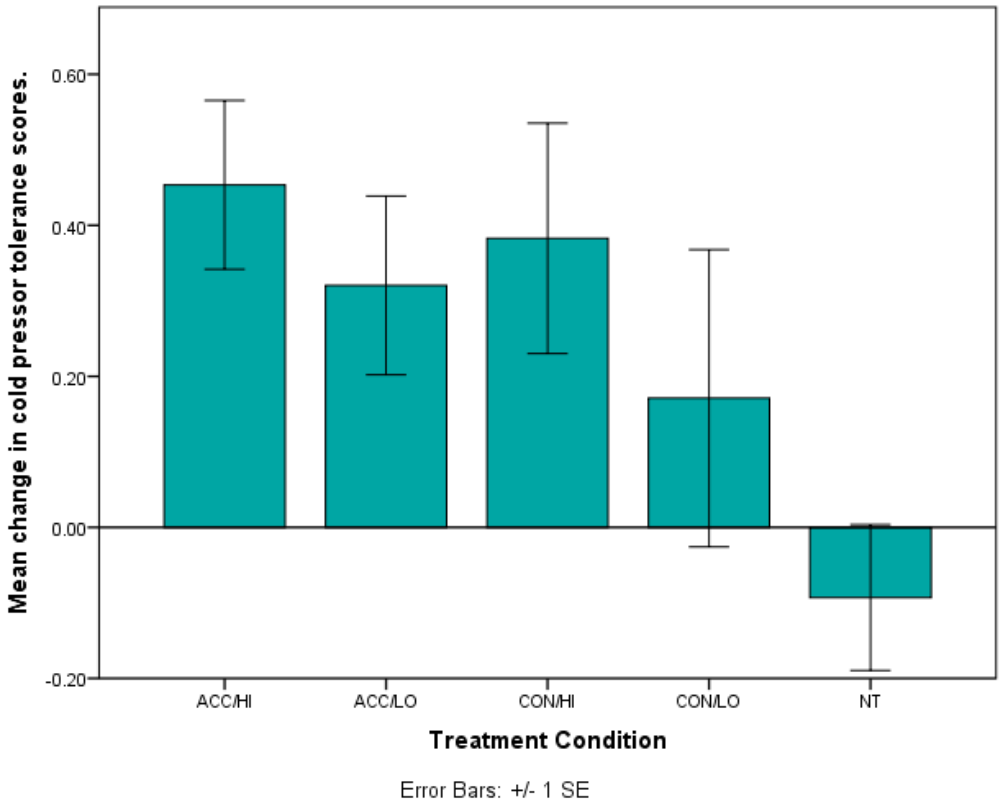

Figure 1: Bar graph of the mean change scores, representing the mean pre-treatment tolerance score subtracted from the mean post-treatment tolerance score for all conditions, positive mean scores indicating an increase in tolerance, and negative, a decrease

To further examine outcomes, and to determine whether there were any significant differences between the experimental conditions, models 1, 2 and 3 (see Table 2) predicted post treatment pain tolerance or self-reported pain scores, using condition as a fixed factor, including five levels (ACC/HI, ACC/LO, CON/HI, CON/LO, NT), including baseline scores as covariates, and post-treatment tolerance as an additional covariate for analyses examining self-report measures of pain (SF-MPQ and affective SF-MPQ). Using post treatment pain tolerance as the dependent variable (Model 1, see Table 2.) the result of the ANCOVA was significant, $F(4, 46) = 2.593$, $p = .049$, $\eta_p^2 = .184$, indicating there were significant differences between the experimental conditions based on post treatment tolerance scores. According to Ferguson (as cited in Kohl, Rief & Glombiewski, 2013), Eta² (η_p^2) can be interpreted as follows .04 = small; .25 = moderate and .64 = strong. Therefore, using Eta² as a measure of effect size revealed a small effect; results indicate that 18% of the variability in post-treatment may be explained by the experimental condition after holding constant pre-treatment. When using SF-MPQ scores as the dependent variable (Model 2, see Table 2.) the result of the ANCOVA was not significant, $F(4, 45) = .1,783$, $p = .149$, $\eta_p^2 = .137$, indicating no significant differences between groups when measured using the post SF-MPQ scores. A further ANCOVA was conducted using the post treatment affective sub component of the SF-MPQ as the dependent variable (Model 3, see Table 2). The result of the ANCOVA was again not significant $F(4,45) = .778$, $p = .546$, $\eta_p^2 = .065$, suggesting that there were no significant differences between treatment conditions based on post treatment affective SF-MPQ scores.

To examine the differences further, models 4, 5 and 6 repeated models 1-3, but used treatment, with two levels - treated (ACC/HI, ACC/LO,CON/HI,CON/LO) or not treated - as a fixed factor instead of condition, to investigate whether being treated was better than no treatment. When employing pain tolerance as the dependent variable (Model 4, Table 2) the result of the ANCOVA was significant , $F(1, 49) = 9.08$, $p = .004$, there was a small effect size ($\eta_p^2 = .156$) indicating that 16% of the variance in post-treatment tolerance score could be explained by the treatment after holding constant baseline tolerance score. When predicted using SF-MPQ scores (Model 5, Table 2), the result of the ANCOVA was also significant, $F(1,48) = 6.063$, $p = .017$, ($\eta_p^2 = .112$) again revealing a small effect size, and showing that 11% of the variance in post-treatment tolerance score could be explained by the treatment after holding constant baseline tolerance score, when measured using SF-MPQ. When examining whether treatment on average was better than no treatment using the affective SF-MPQ score (Model 6, Table 2), the results were not significant, $F(1, 48) = 1.783$, $p = .188$, $\eta_p^2 = .036$, suggesting that based on affective SF-MPQ scores, treatment was not significantly better than no treatment.

The effectiveness of treatment instructions and the impact of expectation condition were also of interest. In order to determine whether acceptance instructions were more effective than control based instructions, and whether there were differences between expectation conditions, a series of two-way ANCOVAs were conducted. Models 7, 8 and 9 repeated models 4-6, but this time instead of using treatment as a fixed factor, instruction, including two levels; ACC instructions or CON instructions, and expectation condition, including two levels; HI and LO, were used as fixed factors. When employing post treatment pain tolerance as the dependent variable (Model 7, see Table 2), the result of the ANCOVA was not significant. There was no

main effect of instruction $F(1, 36) = .534$, $p = .47$, $\eta_p^2 = .015$, or expectation $F(1,36) = .729$, $p = .399$, $\eta_p^2 = .02$, and no interaction between instruction and expectation $F(1,36) = .120$, $p = .731$, $\eta_p^2 = .003$. When conducting the ANCOVA with the dependent variable as post treatment SF-MPQ total score (Model 8, see Table 2), again there was no main effect of instruction, $F(1,35) = .184$, $p = .671$, $\eta_p^2 = .005$, or expectation $F(1,35) = .001$, $p = 1$, $\eta_p^2 = .001$, and no interaction between instruction and expectation $F(1,35) = .352$, $p = .557$, $\eta_p^2 = .01$. And when examining based on affective SF-MPQ scores (Model 9, see Table 2), results again were not significant for instruction, $F(1,35) = .498$, $p = .485$, $\eta_p^2 = .014$, or expectation $F(1,35) = .199$, $p = .732$, $\eta_p^2 = .003$, and there was no interaction, $F(1,35) = 1.067$, $p = .309$, $\eta_p^2 = .030$. Indicating that there were no significant differences at post treatment between instruction types (ACC vs. CON) or expectation type (HI vs. LOW) based on all outcome measures.

To determine whether the expectation manipulation actually changed participants' expectations a further two-way ANCOVA was conducted; the dependent variable was a computed expectation score (expected SF-MPQ scores subtracted from baseline SF-MPQ), instruction type and expectation condition were used as fixed factors, and pre-treatment SF-MPQ score as covariate in model 10 (see Table 2) and AFF-SF-MPQ scores as a covariate in model 11 (see Table 2). When using a computed expectation SF-MPQ score as the dependent variable, and baseline SF-MPQ score as the covariate, the result of the ANCOVA was significant, $F(1, 36) = 8.89$, $p = .005$, revealing a small effect size ($\eta_p^2 = .198$), indicating that 20% of the variance in expectation change could be explained by the expectation condition after holding constant baseline SF-MPQ score. When employing AFF-SF-MPQ score as a covariate to, the ANCOVA result was again significant, $F(1, 36) = 10.913$, $p = .002$, $\eta_p^2 = .233$, revealing a small effect size, indicating that 23% of the variance in expectation change could be explained by the expectation condition after holding constant baseline AFF-SF-MPQ score.

Although expectations appeared to be manipulated successfully, to determine whether expectations effected outcomes, models 12, 13 and 14 repeated models 7-9, but simply included computed expectation as an additional covariate. Results indicated that expectancy was not related to any of the outcomes: post treatment pain tolerance ($\beta = .033$, $t = 1.521$, $p = .137$) (Model 12, see Table 2), post-treatment SF-MPQ score, ($\beta = -.278$, $t = -.814$, $p = .421$) (Model 13, see Table 2), or post-treatment affective SF-MPQ ($\beta = .104$, $t = 1.631$, $p = .112$) (Model 14, see Table 2).

Table 2: Data from the series of ANCOVAs; illustrating the *SS*, *df, F, p*, η_p^2 for main effects, fixed factors, and covariates, for models 1-14

Model		SS	*df*	*F*	*p*	η_p^2
Model 1	*Tolerance (DV)*					
	Main effect					
	-Condition	1.979	4	2.593	.049	.184
	Covariate					
	-Baseline tolerance	19.514	1	102.268	.001	.690
	Error	8.777	46			
	Total	762.751	52			
Model 2	*SF-MPQ (DV)*					
	Main effect					
	-Condition	224.057	4	1.783	.149	.137
	Covariate					
	-Baseline SF-MPQ	704.518	1	22.422	.001	.333
	-Post tolerance	42.207	1	1.343	.253	.029
	Error	1413.964	45			
	Total	11206	52			
Model 3	*AFF-SF-MPQ (DV)*					
	Main effect					
	-Condition	6.294	4	.778	.546	.065
	Covariate					
	-Baseline AFF-SF-MPQ	10.852	1	5.363	.025	.106
	-Post tolerance	.298		.147	.703	.003
	Error	91.056	45			
	Total	182	52			
Model 4	*Tolerance(DV)*					
	Main effect					
	-Treatment	1.682	1	9.080	.004	.156

	Covariate					
	-Baseline tolerance	19.839	1	107.121	.001	.686
	Error	9.075	49			
	Total	762.751	52			
Model 5	*SF-MPQ (DV)*					
	Main effect					
	-Treatment	183.707	1	6.063	.017	.112
	Covariate					
	-Baseline SF-MPQ	712.155	1	23.505	.001	.329
	-Post tolerance	39.537	1	1.305	.259	.026
	Error	1454.314	48			
	Total	11206	52			
Model 6	*AFF-SF-MPQ (DV)*					
	Main effect					
	-Treatment	3.487	1	1.783	.188	.036
	Covariate					
	-Baseline AFF- SF-MPQ	12.400	1	6.341	.015	.117
	-Post tolerance	.155	1	.059	.809	.001
	Error	93.863	48			
	Total	182	52			
Model 7	*Tolerance*					
	Main effect					
	-Instruction	.118	1	.534	.470	.015
	-Expectation	.160	1	.729	.399	.020
	Interaction					
	-Instruction*Expectation	.026	1	.120	.731	.003
	Covariate					
	-Baseline tolerance	15.303	1	69.476	.001	.659
	Error	7.929	36			

	Total	634.639	41			
Model 8	*SF-MPQ (DV)*					
	Main effects					
	-Instruction	6.354	1	.184	.671	.005
	-Expectation	1.186E-006	1	.001	1	.001
	Interaction					
	-Instruction*Expectation	12.181	1	.352	.557	.010
	Covariate					
	-Baseline SF-MPQ	306.155	1	8.853	.005	.202
	-Post tolerance	3.263	1	.094	.761	.003
	Error	1210.342	35			
	Total	7914	41			
Model 9	*AFF-SF-MPQ(DV)*					
	Main effect					
	-Instruction	.983	1	.498	.485	.014
	-Expectation	.236	1	.199	.732	.003
	Interaction					
	-Instruction*Expectation	2.107	1	1.067	.309	.030
	Covariate					
	-Baseline AFF-SF-MPQ	3.151	1	1.596	.215	.044
	-Post tolerance	.735	1	.372	.546	.011
	Error	69.120	35			
	Total	119	41			
Model 10	*Computed change in expectation SF-MPQ(DV)*					
	Main effect					
	-Instruction	.522	1	.062	.804	.002
	-Expectation	74.621	1	8.890	.005	.198

	Interaction					
	-Instruction*Expectation	14.715	1	1.753	.194	.046
	Covariate					
	-Baseline SF-MPQ	196.501	1	23.410	.001	.394
	Error	302.181	36			
	Total	2180	41			
Model 11	*Computed change in expectation SF-MPQ(DV)*					
	Main effect					
	-Instruction	43.472	1	3.361	.075	.085
	-Expectation	141.167	1	10.913	.002	.233
	Interaction					
	-Instruction*Expectation	29.663	1	2.293	.139	.060
	Covariate					
	-Baseline AFF-SF-MPQ	33.007	1	2.552	.119	.066
	Error	465.675	36			
	Total	2180	41			
Model 12	*Tolerance*					
	Main effect					
	-Instruction	.008	1	.037	.848	.001
	-Expectation	.008	1	.036	.851	.001
	Interaction					
	-Instruction*Expectation	.107	1	.505	.482	.014
	Covariate					
	-Baseline tolerance	15.646	1	73.628	.001	.678
	-Computed expectation	.492	1	2.314	.137	.062
	Error	7.438	35			
	Total	634.639	41			

Model 13	*SF-MPQ*					
	Main effect					
	-Instruction	5.072	1	.163	.689	.005
	-Expectation	4.689	1	.134	.716	.004
	Interaction					
	-Instruction*Expectation	5.485	1	.157	.694	.005
	Covariate					
	-Baseline SF-MPQ	276.688	1	7.924	.008	.189
	-Computed expectation	23.135	1	.663	.421	.019
	-Post tolerance	4.932		.141	.709	.004
	Error	1187.207	34			
	Total	7914	41			
Model 14	*AFF-SF-MPQ*					
	Main effect					
	-Instruction	.089	1	.047	.830	.001
	-Expectation	2.234	1	1.185	.284	.034
	Interaction					
	-Instruction*Expectation	3.818	1	2.025	.164	.056
	Covariate					
	-Baseline AFF-SF-MPQ	1.373	1	.728	.399	.021
	-Computed expectation	5.014	1	2.660	.112	.073
	-Post tolerance	.726	1	.385	.539	.011
	Error	64.105	34			
	Total	119	41			

Discussion

Research has now reliably identified that pre-treatment outcome expectations, which are considered to be a common factor in the non-specific model of psychotherapy, can impact psychotherapy outcomes. This finding has been observed for wide range of therapies, for the treatment of many disorders; however this effect had yet to be examined in regard to the use of ACT. The present study re-examined (Hayes, 1999; Keough et al., 2005) the effects of two instructional interventions, that represent

competing treatment models in psychotherapy (ACT and CBT), on pain tolerance and self-reported responses to a cold pressor task. However, the primary aim of this research was to explore whether participants' expectations of the benefit of their treatment instructions would influence performance on the cold pressor task and self-report measures of pain, thus beginning to explore how expectations may impact upon treatment outcomes for patients with chronic pain, when treated with ACT.

On examination of the descriptive data, the results demonstrated that tolerance time increased for all treated conditions, but not for the no-treatment condition, and self-reported pain ratings decreased for all treated groups but not for the untreated group. When examining the data further, significant differences were observed between the conditions; the results indicated that being treated was significantly better than not being treated, a small effect size was identified. However, consistent with our predictions, findings indicated that Acceptance-based and Control-based instructions did not differ in their effectiveness for pain tolerance or self-report measures of pain. More importantly, when examining participants' expectations, findings indicated that expectations were manipulated successfully; those in the high expectation conditions expected to report lower pain responses after completing a subsequent cold pressor task under their new treatment instructions, than those in the low expectation conditions. Although expectations were found to be manipulated, when examining outcomes based on participants' expectations, contrary to our predictions, results indicated that expectations did not impact on either outcome measure - pain tolerance or self-reported responses. In summary, neither Acceptance-based or Control-based instructions were found to be superior, and no significant differences were observed between participants' post treatment scores based on their expectations of their treatment rationale.

Findings from the current study contradict earlier analogue studies, which have previously found that acceptance based rationales are superior to control rationales for both pain tolerance (Hayes, 1999) and self-report measures (Keogh, 2005). The findings presented for this study are interesting as they fall in line with the more recent meta-analysis conducted by Veehof et al., (2011), which proposed that ACT and CBT are comparable in their effectiveness. The results here support the findings of this meta-analysis, and provide further support for the common factors debate, as neither treatment rationale was found to be superior; indicating that the specific factors of these rationales had little impact. Although no significant differences were found between differentially instructed groups at post treatment, there are some limitations that warrant consideration when interpreting these results. For instance, participants were only provided with brief written instructions for the treatment they experienced; studies using alternative instructional methods have found differing results. For example, when longer instructing periods have been utilized, acceptance-based interventions have been identified as more effective than control-based interventions (Roche, Forsyth, & Maher, 2007). Moreover, using a metaphor alongside acceptance instructions, which is believed to be key to the therapeutic delivery of ACT (Hayes, 2004), has also been found to produce superior results for the use of ACT in comparison to CBT for completing a cold pressor task (Gutierrez, Luciano, Rodriguez & Fink,2004). Longer and more comprehensive instructional periods may, therefore, have created a more accurate reflection of clinical practice, it could be that the instructions used in the current study may not have usefully

represented either treatment rationale, or exhibited them to their full potential, limiting the impact of the 'specific' ingredients of the treatment rationales.

In spite limitations regarding the instructions, it could be argued that in previous research where ACT has been identified to be a more beneficial strategy, for example, for completion of the cold pressor (Hayes, 1999; Keough, 2005) and more broadly with regard to studies based in clinical populations (Vowles et al., 2007), results may have been biased due to an allegiance effect; whereby researchers typically find the most beneficial treatment is the one to which they have a theoretical allegiance (Jacobsen, 1999). Whereas, in this study, although the experimenter was not blind to the treatment condition, (which is actually reflective of clinical practice as clinicians are not able to stay blind to the treatment they provide (Wampold, 2001)), they had no allegiance to either rationale, therefore results may have been less likely to be altered due to subtle allegiance effects; methodologically, for example tone of voice or enthusiasm during testing, or statistically, during analysis of results. Furthermore, although the interventions were only provided in the form of brief instructions, they were written with the intention to include what was deemed as the most 'specific' indicators of the treatment rationales for both ACT and CBT, and both forms of treatment were seen to be more effective than the no treatment group, therefore it could be argued that if there are gross differences in outcomes when treated with either ACT or CBT, it was not unreasonable to expect to still observe this here. Also of note, when examining the impact of instructions on pain tolerance and self-reported responses, no difference was observed between the opposing treatment rationales. It could be argued that this was due to the use of a small sample, making a significant finding more difficult to detect; however a small effect size was observed, adding weight to the implication that neither ACT nor CBT may be a superior form of psychotherapy. Rejecting the specificity of these forms of treatment would have major implications for clinical practice, training for clinicians and future research on psychotherapy, with a major shift of focus to non-specific methods. In summary, although the current results are supportive of the common factors debate, with regard to the use of ACT and CBT, they should be interpreted with caution until additional research has been conducted to support and replicate such results.

In respect of the main aim of the current study, as previously noted, results indicated that expectations were successfully manipulated; participants who were told that their treatment would be effective had higher expectations of the benefit of their treatment rationale than those who were manipulated in to thinking they would be less effective. This finding is important, it has furthered our knowledge in the study of expectations, identifying that expectations regarding ACT, which have not previously been investigated, may be malleable. These findings support an interesting notion identified previously by Kirsch (1990) that clinicians should aim to identify and maximise expectations; the results here indicate that clinicians may potentially be able to alter patient expectations regarding the use of ACT and CBT. Unfortunately, however, this manipulation was not observed to affect the post-treatment outcomes. This does not follow the broader patterns observed in the literature (Constantino, 2012), where studies have reliably identified that pre -treatment outcome expectations impact treatment outcomes for many psychotherapeutic practices (Greenberg et al., 2006; Noble et al., 2001; Constantino, 2012); several explanations have been considered regarding why this result may have occurred in this study,

previous research does not directly explain why, therefore the following explanations are only speculative.

Firstly, it may be that manipulated expectations of a simple cold pressor task are not ingrained or meaningful to those who undergo the task, as they could be for those suffering from chronic pain (Long & Guite, 2008), or other disorders (Rutherford et al., 2010; Safren et al.,1997), and they may, for example, have been suffering for some time, and have more invested in the outcomes of treatment. Therefore, when participants carried out the task, their expectations may not have been strong enough to remain, or impact outcomes, indicating that this study may not be accurately reflecting naturally occurring expectations of patients. Furthermore, this finding may have important implications if clinicians are to try and manipulate expectations, as they may not be strong enough to have an impact, or for example the expectations patients already hold may be far more influential than any they intend to create or influence.

Interestingly, others have previously suggested that expectations are optimal when they are moderate, and therefore unrealistically low and unrealistically high expectancies should be avoided (Goossens et al., 2005). As expectations were purposely manipulated in this experiment to try to ensure a change, it may be that they were indeed unreasonably high or low, which may have resulted in them having little impact. When considering this in terms of clinical populations, and specifically with regard to chronic pain, this may be an important factor to further consider, as previous research has identified that the more chronic the symptoms, the less likely patients are to express a high level of confidence in the outcome (Goldstein, Morgenstern, Hurwitz, & Yu, 2002), which may indicate that they may have unreasonably low expectations, and may be less likely to benefit from treatment.

With regard to the study by Shaw and Blanchard (1983), in which they examined the effect of neutral or positive instructional sets on a stress management program, results identified that after expectations had been successfully manipulated, those with high expectancies were then more likely to practise treatment procedures than those with neutral expectations. This study demonstrates how expectations may mediate treatment outcomes, by influencing the behaviour of patients over the course of treatment, which then impacts on treatment outcomes. Indicating that higher compliance may be one of the mechanisms through which expectations operate. In relation to the current study, it may be that as it was a short analogue style study participants were unable to engage in any of the subsequent behaviours that are a result of expectations, which lead to improved outcomes, again this may explain why expectations were not seen to be effected.

But, most simply, no effect of expectation may have occurred due to error in our measurement of expectancy, which may have resulted in attenuation of any correlations: the correlations may have been weakened, resulting in an under-estimation of the relationship between expectations and outcomes. Future research would benefit from examining correlations whereby an attempt is made to remove this error; to estimate the relationship disattenuated of measurement error, to lessen the likelihood of misinterpretation of data.

It is evident that there are a number of possible explanations for the results obtained and future research, to be discussed, is needed to further examine these speculations. But first it is also important to acknowledge that this study has a number of other methodological limitations that must be considered when interpreting the results. Given that the current study did not employ any checks to measure whether participants followed the acceptance or control based rationales, it is possible that participants may not have understood or utilised their treatment strategy. It would be of benefit for future research to include a manipulation check to determine compliance with instructions; this could be in the form of a semi-structured interview or a brief questionnaire. This would allow for making firmer conclusions regarding the usefulness of ACT and CBT, and more accuracy regarding the impact of expectations on these treatment rationales.

A further methodological concern relates to the cold pressor procedure; often when conducting the cold pressor task, a bath of water (37C) is used to bring participants' hands to the same temperature before completion of the ice water task. This method was not used in the current study; it may be that the use of the more standardized procedure may alter the findings of this study and, although it is thought to be unlikely that this method had a dramatic influence on the results, it would be beneficial if future research aimed to use this standardised procedure, as this would enable studies to be more accurately compared.

Furthermore, although the aim was to measure expectations with the adapted SF-MPQ, in reality participants may have been reacting to what they thought were the experimenter's wishes when completing the questionnaire. The self-report measure may have been more subject to demand than the cold pressor, as it could have been easier to comply with than the aversive stimulus; this could be an indication of why expectations were seen to be manipulated but not to effect outcomes, therefore results may not have necessarily been a true reflection of their expectations. Moreover, expectations have already been observed to impact treatment outcome in a clinical setting, when treating chronic pain with CBT. This poses a fundamental question of how applicable these results, and more broadly results from any analogue study that uses the results from acute cold pressor pain tasks, to speculate how this may impact on a chronic pain populations, or other disorders. However studies which have found expectations to impact on the outcomes of CBT treatment were examining naturally occurring expectations (Goossens, 2005); this may indicate that there may just be differences between these and expectations and others that have been manipulated.

Finally, all findings and speculations must be considered with caution, as one vital factor that must be taken into account is that a small sample was used; this may have affected the ability to notice statistical differences, and the power of this study may also have been unreliably low, making it difficult to detect genuine effects. It would be of benefit for future research to conduct a priori, or post power analysis to help estimate the number of participants needed for the experiment to have enough power to detect the desired effects, allowing for the ability to make more solid inferences and meaningful conclusions based on the results obtained.

With the limitations and implications in mind, this study has successfully generated questions, upon which future research can base examinations; there are many

avenues still to be explored. Future research could begin by conducting further analogue studies that better represent clinical settings, for example, as noted previously, expectations may not have been meaningful or important for participants. It would be of benefit to conduct studies in which the outcome was more meaningful, such that for example there was an end goal, making outcome expectations more important for participants. In addition it would be a priority to determine whether naturally occurring expectations of ACT effect treatment outcomes in clinical populations; but as this study has identified that expectations regarding ACT may be malleable, it would also be of interest to examine whether expectations of ACT can be manipulated in a clinical setting for those suffering with chronic pain or other disorders, and if so how best to positively manipulate expectations by identifying which factors may make this successful. Possible methods to explore could be, for example, providing a strong rationale for treatment, addressing a patient's concerns about therapy, or setting appropriate goals.

Furthermore, this study has highlighted the need for future research to examine the mechanisms by which expectations operate, as here, expectations were manipulated but they did not impact outcomes, and although in the literature expectations are seen to impact on treatment outcomes, little is known about the mechanisms through which this occurs. As aforementioned, this may be through higher compliance to treatment homework (Shaw & Blanchard, 1983), but, no doubt there may be wide variations for different therapies, disorders, and individuals that warrant further exploration. One potential mechanism could be the therapeutic alliance, as prior expectations may affect the quality of relationship between the patient and therapist, and in turn impact treatment outcomes, the development of a therapeutic alliance ACT may be important to further investigate as ACT is based on a particularly intense therapeutic relationship (Roche et al., 2007).

Moreover, efforts should now be applied to further developing tools for measuring expectations and their mechanisms, for use in experimental trials and in clinical practice. As has been identified, expectations are extremely complex, and it may be that more qualitative methods are necessary to encompass the construct fully, and reliably; this will allow for a better understanding of what determines initial expectations, and could track how they may change over the course of treatment.

In broader terms, expectations are only one common dimension, which are thought to belong to a host of other factors that are all believed to be responsible for the benefits of psychotherapy treatment. Examination of other non-specific factors is necessary to determine how they may also impact the treatment outcomes of both ACT and CBT; factors such as therapist characteristics, and more generally the healing context are yet to be explored. Furthermore, research should also aim to investigate how the common factors may be connected, these dimensions may not function independently; this may also help to explain why expectations in this study were not seen to impact outcomes, as they were studied in isolation. In addition, this study only touched upon one form of expectations, but they come in many guises. Future work is necessary to examine other forms, such as process expectations; expectations about what may happen over the course of therapy. Again this may be of particular importance with regard to ACT as it is often seen as 'unconventional' (Hayes & Smith, 2005), and for patients who suffer from chronic pain; process

expectations may be of particular importance as they are likely to have had much prior treatment experience, which may impact their expectations of future treatment.

In summary, results from this study provide further support for the common factors debate identifying that ACT and CBT may be equal in their effectiveness, and although our findings did not indicate that expectations impact treatment outcomes for ACT and CBT, this study has identified gaps in the literature which can be further examined. With further understanding of the expectation construct, other common factors, and continued development and testing, expectations may eventually be identified as core factor for all psychotherapy practice. With the broader hope of integration into a common factor based psychotherapy model, setting the foundations for significant and meaningful treatment change.

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