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Abstract

To date, there is little support for the use of any psychotherapy to address post-stroke anxiety. Similarly, there have been no trials of Acceptance and Commitment Therapy (ACT) for post-stroke anxiety, but clinician opinion suggests that an ACT approach may be effective in this context. In this case study a high-functioning younger man with post-stroke anxiety and associated medically unexplained symptoms (chest pain and dizziness) was assessed, and treated using an ACT approach. Mediators of change for both ACT (psychological flexibility) and cognitive therapy (illness perceptions) were recorded as were measures of depression, anxiety and stress. By the end of treatment the client was free of chest pain, had successfully returned to work, and had considerable reductions in anxiety, with smaller reductions in depression and stress. As outcomes improved, concomitant changes in psychological flexibility and illness perceptions were observed. The potential benefits offered by an ACT approach to post-stroke anxiety are discussed.

Keywords: acceptance and commitment therapy; ACT; stroke; post-stroke anxiety; chronic illness

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1 Theoretical and research basis for treatment

Stroke is broadly defined as an acute-onset neurological incident involving haemorrhage or interruption of the blood supply within the brain (Montagu, Reckless & Buchan, 2012). Stroke usually occurs in older adults (mean 75 years [Leys et al., 2002]) but can also be experienced by younger adults, with nearly 5000 people of working age experiencing a stroke in the United Kingdom each year (Petersen, Peto, Scarborough & Rayner, 2005).

Stroke generally happens with little warning: it is a sudden and life-threatening event that can give rise to immediate disability. It is thus unsurprising that some survivors display symptoms of post-traumatic stress disorder (Favrole et al., 2013) and between 20% and 25% of stroke patients experience symptoms of anxiety (Campbell-Burton et al., 2012; Burvill et al., 1995; Lincoln , Gladman, Berman, Luther & Challen, 1998). Unfortunately, in many cases post-stroke anxiety does not appear to improve naturally over time. In a longitudinal study, 75% of those who initially showed symptoms of generalised anxiety disorder were still experiencing these symptoms three years later (Åström, 1996).

Alongside the direct trauma of the event, post-stroke anxiety may be supported by fears of suffering another stroke (Åström, 1996), or a related avoidance of potentially stressful events. A synthesis of qualitative studies revealed that younger survivors are particularly anxious to know the cause of their stroke, so that steps can be taken to reduce the chances of recurrence (Lawrence, 2010). Adjusting to and managing stroke on a day-to-day basis may also contribute to anxiety. Stroke is considered a chronic illness; survivors may have limb weakness, perceptual disturbance and communication difficulties among a host of other impairments (Clarke, 2009). These impairments may cause survivors to adapt their

environment, social lives and relationships. However, a stroke may also bring some beneficial outcomes for survivors, and many report that the experience has helped them to recalibrate their values and make positive changes in their lives (Lawrence, 2010).

The application of psychotherapy to post stroke-anxiety and depression

A recent Cochrane Review (Campbell-Burton et al., 2011) observed insufficient evidence to support the use of psychological interventions to manage post-stroke anxiety, but suggested that drug treatment with Paroxetine and buspirone hydrochloride may be efficacious. Indeed, we are unaware of any published evaluations of psychotherapy alone for post-stroke anxiety. However, there have been several published evaluations of psychological interventions which have aimed to improve post-stroke depression (Hackett, Anderson, House & Xia, 2009). To date, evaluations of traditional cognitive therapy (Lincoln & Flannaghan, 2003; Lincoln, Flannaghan, Sutcliffe & Rother, 1997) for post-stroke depression have returned unconvincing results, while interventions which focus more closely on behaviour change, such as motivational interviewing (Watkins et al., 2007; Watkins et al., 2011), have shown more positive results.

Acceptance and commitment therapy (ACT) for post-stroke anxiety

So far there have been no trials or case studies of ACT for post-stroke mood disturbance (either depression or anxiety) but recent critical reviews (Kangas & Macdonald, 2011; Soo, Tate & Lane-Brown, 2011) suggest that ACT may offer several benefits over traditional cognitive therapy approaches.

The ACT model is closely linked to a behavioural account of language called Relational Frame Theory (RFT: see Hayes, Barnes-Holmes, & Roche, 2001). Put simply, RFT posits that in particular contexts, learned ways of relating cognition and events allow words, thoughts and

images to function as if equivalent to the events which they describe, and thus may transform the psychological meanings and behavioural influences of these events (McCracken, 2011). People may therefore experience the world from within their own verbal constructions (fears of future outcomes, ruminations on past behaviours) rather than from direct contact with the present moment. Subsequently they may engage in distress-control methods intended to control thinking and feeling, which are often at odds with their own values or the demands of the current situation.

<Figure 1 here>

ACT aims to combat the caustic possibilities of language within cognition by helping participants to improve their psychological flexibility (Hayes, Luoma, Bond, Masuda & Lillis, 2006; Bond et al., 2011). Psychological flexibility is defined as the ability to contact the present moment as a fully conscious human being, and to either change or persist in behaviours when doing so serves one's values (Hayes, Strosahl, Bunting, Twohig & Wilson, 2004). It is conceptualised as arising from the interaction of six overlapping and interdependent processes (see Figure 1). Thus psychological flexibility might result from a combination of being able to accept private experiences such as bodily sensations and emotions (acceptance); experiencing thoughts merely as transient mental events (cognitive defusion); awareness of the self as separate from the process of thinking (self-as-context); being fully present in one's current environment as opposed to struggling with thoughts (contact with the present moment); being aware of what matters on a moment-to-moment basis (valued-living); and taking action when doing so serves one's values (committed action) (see Hayes et al., 2006).

ACT uses a range of techniques to improve psychological flexibility. These include meditative techniques (mindfulness) which aim to help participants engage in the present and to

accept difficult feelings; defusion techniques aimed at undermining the literality of thoughts; and techniques to help orient a person to their values (Gillanders, 2011). ACT is concerned with behaviour change, and thus improved psychological flexibility serves the purpose of broadening effective behavioural repertoires, which support valued-living (Hayes et al., 2004). ACT explicitly aims to be experiential and therapists are expected to model defused, connected stances while reinforcing flexible behaviours (Harris, 2009).

Why might ACT be applicable to stroke?

ACT takes the philosophical stance that distress is a normal part of life, a consequence of having values and goals that are perennially subject to adversity and the possibility of failure (Harris, 2009). This is in contrast to the philosophical stance of the dominant model of psychotherapy, traditional cognitive therapy, which conceptualises distress as a symptom requiring treatment. Thus, while cognitive therapy seeks to improve one's ability to control distress, ACT seeks to enable individuals to carry out valued behaviours while still experiencing distress (Hayes et al., 2006). This philosophical stance confers several benefits upon ACT over traditional cognitive therapy in its application to post-stroke anxiety. Distress seems to be a common result of stroke (Burvill et al., 1995; Lincoln, 1998) and, given the functional consequences of stroke (Clarke, 2009; Lawrence, 2010), it seems likely that some degree of distress following stroke is to be expected. Thus cognitive therapy's conceptualisation of distress as maladaptive may have the effect of undermining stroke-survivors' understandable distress at their situation (Gregg, Callaghan, Hayes & Glen-Lawson, 2006). In teaching clients to accept distress rather than challenge it, ACT avoids this risk. In addition, while cognitive therapy seeks to teach stress-control techniques, ACT is freed from this necessity and can instead focus on functionality, encouraging participants to broaden their behavioural repertoire to include more valued activity even as they experience the plausible

distress resulting from stroke (Kangas & MacDonald, 2011; Soo, Tate, & Lane-Brown, 2011). Subsequently, ACT may be ideally placed to catalyse the post-traumatic growth described by Lawrence (2010).

Another key element of traditional cognitive therapy is cognitive restructuring: teaching clients to monitor and challenge the thoughts, assumptions and beliefs that might be causing them distress. Kangas & MacDonald (2011) argue that such an explicitly metacognitive strategy can be problematic for people with cognitive impairment (e.g. post-stroke), and that ACT, with its more explicit focus on behaviour, may be more suited. One might contend that where cognition is addressed in ACT (e.g. metaphor) it also has a heavy reliance on executive function (e.g. abstraction), language and visualisation. Nonetheless, cognitive restructuring assumes that distress is at some level linked to beliefs which are maladaptive or do not serve a person's purposes. Thus the therapist should help clients develop more adaptive beliefs and this should reduce distress. In chronic illness, however, beliefs or illness perceptions may be objectively correct (Graham et al., 2013; Harrison et al., 2014). This is important because it may leave cognitive restructuring little room to make significant changes in the content of cognition, and this process may again undermine justifiable beliefs or distress. Additionally shifting from unhelpful to beneficial illness schemata may also seemingly require one to induce unnecessary additional distress in an already distressed group (Graham et al., 2013 provides a detailed example of this).

Such a depiction of traditional cognitive strategies may appear simplistic, and we accept that an experienced cognitive therapist might argue that, in these circumstances, their most useful strategy would be to target the behavioural influence (function) of thinking, rather than its objective accuracy. Yet we would argue that such a strategy is more aligned with the conceptual model of ACT than of cognitive therapy, given the latter's emphasis on the centrality of meaning and its focus as a target for intervention (e.g. Alford & Beck, 1997).

As the literature stands, given cognitive therapy's poor performance in evaluations with stroke populations (Lincoln & Flannaghan, 2003; Lincoln, Flannaghan, Sutcliffe & Rother, 1997), it is possible that distress-control and cognitive restructuring offer little benefit to this patient group. Similarly, despite its champions (Kangas & MacDonald, 2011; Soo, Tate & Lane-Brown, 2011), it is not yet known to what extent an ACT approach might be helpful for distress in stroke populations. However, evaluations of ACT interventions have shown promising efficacy in trials with other neurological conditions (Graham, 2012; Lundgren, Dahl, Melin & Kies, 2006; Sheppard, Forsyth, Hickling & Bianchi, 2010), while case series with people experiencing traumatic brain injury (Whiting, Simpson, Ciarrochi, & McLeod, 2012) and multiple sclerosis have also returned encouraging results (Gillanders & Gillanders, In Press).

2 Case introduction

John (not his real name), a professional man in his early forties, was referred for neuropsychological assessment several months after experiencing a stroke, in order to establish possible cognitive consequences. During this process, John asked about treatment of his anxiety and was subsequently referred for psychotherapy. He was treated by a Trainee Clinical Psychologist, under the supervision of a Consultant Clinical Neuropsychologist.

3 Presenting complaints

John stated that he had been experiencing high levels of anxiety for many years but that, since his stroke, his anxiety had worsened. In addition, he had been experiencing chest-pain and dizziness for many years with these again becoming more distressing post-stroke. He had been on leave from work for several months due to his stroke.

4 History

John reported that he had “always been stressed” and had always had problems sleeping. He had a small group of siblings, with several experiencing significant health problems. Growing-up, he had excelled academically. He had later been very successful in his work and achieved frequent promotions; he now worked in a job which required creative thinking and high-level analytical skills. He was a highly motivated worker and, up until his stroke, worked long hours. He admitted that he found it hard to switch off from work: for example, he reported instances of driving very long journeys but of having no recollection of the journey due to ruminating on aspects of his work. Indeed, he reported that he struggled to relax in any context, even while socialising, due to his racing mind.

Several years prior to his stroke, John had begun to experience periods of dizziness. He thus presented to a medical doctor and a physical health problem was subsequently detected. Despite this, though without giving any formal psychiatric diagnoses, doctors felt that his dizziness was best explained by panic and anxiety as opposed to this physical health problem. Several months later, John began to develop significant chest pains; clinicians again attributed this to anxiety and panic. Subsequently, John attended sessions of traditional cognitive therapy and used a number of cognitive therapy self-help books. However, the severity of his symptoms appeared to increase and he found himself spending more and more time trying to get rid of his anxiety and medically unexplained symptoms.

Approximately one year after the onset of his chest pain, John experienced a stroke. While his physical and cognitive rehabilitation were excellent, his anxiety appeared to increase and he reported ruminating on the cause of stroke. His chest pain and dizzy spells were still present and he could not decide whether a physical cause or anxiety had been responsible for his stroke. His impending return to work appeared to elicit further fears about his ability to withstand stress, and about stroke recurrence.

5 Assessment

Assessment comprised the majority of the first session, but was ongoing throughout treatment. Assessment incorporated an interview relating to the problem as experienced by John; neuropsychological testing; and questionnaires recording distress and processes that might be underlying it (psychological flexibility or illness perceptions). The assessment was undertaken in the vein of cognitive behavioural therapy, with emphasis placed on understanding factors contributing to the problem in the here and now (Whitfield & Davidson, 2007).

Neuropsychological assessment

A battery of neuropsychological tests was undertaken with John, including the Wechsler Adult Intelligence Scale, Fourth Edition (Wechsler, 2008) and The Test of Everyday Attention (Robertson, Ward, Ridgeway &Nimmo-Smith, 1994). To summarise, these tests indicated that John had experienced only minor cognitive deficits as a result of the stroke, limited to aspects of language processing. They suggested that cognitive impairment should not substantially inhibit his ability to participate in psychotherapy, nor resume previous levels of function. The brain areas affected by the stroke did not suggest this as a primary cause of emotional disturbance.

Standardised questionnaires

Short-form Depression Anxiety Stress Scale (DASS-21) (Lovibond & Lovibond, 1995)

The DASS-21 was used to measure the extent of John's emotional disturbance. This is a 21-item, validated (Mitchell, Burns & Dorstyn, 2008; Ownsworth, Little, Turner, Hawkes & Shum, 2008) measure, which records emotion on three scales (depression, anxiety and stress) with possible scores ranging from zero to 42. According to the classification scales for the

DASS-21, at the start of therapy John had extremely severe levels of anxiety, extremely severe levels of stress and moderate depression (see Figure 2).

<Table 1. Here>

Brief Illness Perceptions Questionnaire (Brief-IPQ) (Broadbent, Petrie, Main & Weinman, 2006)

Though illness perceptions were not a target of the intervention, we wanted to observe how these changed with treatment. John's beliefs about his stroke were measured with the Brief-IPQ, which has shown acceptable reliability and validity in samples of people with chronic illness (Broadbent et al., 2006). This measure records illness perceptions on eight domains: identity, timeline (acute/chronic), personal control, treatment control, coherence, consequences, concern and emotional representation. Participants respond to each item on a 10-point scale, with greater scores indicating respectively: greater belief that the illness has many symptoms, is chronic, can be controlled by their own behaviour, can be controlled by treatment, makes sense to the participant, has many consequences, causes more concern, and causes more distress. John showed extreme levels of concern about his stroke, perceived it to have major consequences, and attributed a lot of negative emotion to it. He felt that neither he nor his treatment could control his stroke, but believed his stroke may subside with time. Interestingly, he also felt that he had a good understanding of his stroke (Figure 4).

Acceptance and Action Questionnaire (AAQ-II) (Bond et al., 2011)

The AAQ-II is a single-domain measure designed to measure psychological (in)flexibility. It consists of seven items, e.g. 'Emotions can cause problems in my life'. Respondents are required to indicate the extent to which these statements apply to themselves

on a rating scale from one (never true) to seven (always true); scores range from seven to 49, with higher scores indicating greater inflexibility. In analyses with over 2000 participants the AAQ-II displayed acceptable psychometric properties (Bond et al., 2011). At the start of treatment, John's AAQ-II score indicated high psychological inflexibility, similar to the norms provided by Bond et al. (2011) for people seeking outpatient treatment for substance misuse problems (see Figure 3).

<Figure 2 here>

<Figure 3 here>

<Figure 4 here>

6 Case conceptualisation

Many of John's behaviours can be described using the six processes underlying psychological inflexibility (Hayes et al., 2006; see Figure 1). John had difficulty accepting unpleasant physical sensations (chest pain, dizziness) or feelings of anxiety. He often got lost in his thoughts (e.g. driving on autopilot), and his rumination and focus on problem-solving meant his thinking often concerned the past or future (lack of contact with the present moment). He was attached to his judgements and evaluations of the world (cognitive fusion), and could not see these cognitions as being separate from his own sense of self (attachment to the conceptualised self). This meant that his thoughts could seem very threatening. While John had a strong sense of what was important to him (values), he often struggled to make decisions and behave effectively in a given situation. For example, due to over-thinking he could not decide whether to present to his doctor when he felt his symptoms worsen (lack of committed action).

John's pre-intervention psychological inflexibility can be explained using a formulation based on functional analysis, as is common in ACT (Bach & Moran, 2008). This approach aims to understand the function of a particular behaviour by considering the contexts and consequences of that behaviour. Put simply, when John experienced cognitive or somatic

symptoms of anxiety (e.g. chest pain; thoughts about having another stroke), he put into practice various behaviours designed to reduce his immediate distress (e.g. close monitoring of his body; analysing cognition in the hope that he might be able to problem-solve). This behaviour appeared to be positively reinforced in so far as it gave John a sense of control over his symptoms, albeit a very brief one; more pertinently, it also appeared to be negatively reinforced through the process of experiential avoidance.

Experiential avoidance occurs when an individual is unwilling to stay in contact with certain private events, be these thoughts, bodily sensations, emotions, memories, etc., and thus undertakes behaviours designed to diminish their form or frequency (Blackledge & Hayes, 2001). Such attempts to remove or control these events can, ironically, serve to increase both their severity and intrusiveness (Wegner, 1994). Within traditional cognitive therapy, worry and rumination have been posited as forms of short-term avoidance that are ultimately maladaptive (Borkovec, Ray & Stober, 1998). However, RFT and ACT further posit that behaviour under a verbal rule becomes insensitive to more direct, environmental contingency (Hayes, Brownstein, Zettle, Rosenfarb & Kom, 1986). In John's case, this might explain why he persisted with worry and rumination even though objectively they appeared to offer little benefit: i.e. because a long-standing, subjective verbal rule such as "analysis will solve the problem", which had been of benefit in other situations (particularly in his job), was controlling behaviour.

Behaviours that serve the function of experiential avoidance can often be in direct contradiction to one's values (Blackledge & Hayes, 2001). John was sociable, caring, sporting and ambitious: using control strategies to avoid distress and uncomfortable bodily sensations prevented him from building a valued present. For example, he mentioned that attending to bodily sensations affected his performance at work.

It is notable that, when John presented for medical investigation of uncomfortable private events (chest pain and dizziness), another physical health problem had been revealed. Despite doctors suggesting that these were not related, it is likely that this outcome (the successful use of analysis to uncover a health problem which could then be treated) served to reinforce his existing verbal-rule system pertaining to analysis and control. It is also possible that cognitive therapy, with its emphasis on controlling symptomatology, had a further reinforcing effect.

As per the observations of Lawrence (2010), John had a strong desire to know the cause of his stroke, so that this could be changed or avoided in the future. Understandably, in the light of the formulation so far, avoiding or removing anxiety appeared to be a key aspect of this for John. The fact that medical doctors were unable to suggest a definite cause is likely to have heightened his desire to analyse and problem-solve. Outside of the ACT formulation, John held extreme illness perceptions regarding his stroke (see Figure 4). However, these were in keeping with his current circumstances: recovering from a stroke, coupled with a long-standing tendency towards psychological inflexibility.

7 Course of treatment and assessment of progress

Content of the intervention

Several overlapping techniques were introduced sequentially to undermine the processes contributing to John's psychological inflexibility (see Table 1 and Figure 3). Many of the intervention techniques were adapted from Harris (2009) and Hayes and Smith (2005).

The first technique was workability analysis. John was asked to think about the various ways he had tried to get rid of anxiety, and how successful these had been. He was able to realise that these strategies had not been effective. Experiential exercises investigating the

futility of thought-suppression (e.g. the white bear task [Wegner, 1994]) were also presented to John early in therapy.

In keeping with the case conceptualisation, integral components of the intervention were designed to help John open-up to and accept difficult thoughts and feelings, as opposed to trying to avoid or control them. Several sessions involved non-judgementally attending to medically unexplained symptoms. He was coached in observing his chest pain; describing its colour; then seeing if he could make it move across his body. He was then asked to increase his chest pain, which he noted paradoxically achieved a reduction in chest pain. ACT makes regular use of metaphor to convey ideas (Harris, 2009), and this was used across all stages of therapy (see Table 1). Thus, within the agenda of acceptance as opposed to control or analysis, he was asked to personify his chest pain. John chose to personify this as an annoying television character.

John agreed that he lived mostly in his thoughts instead of noticing his broader environment, and could see that being present in his environment might enable his values. Therefore, present-moment tasks (mindfulness exercises) were used liberally throughout the sessions and featured as "homework" between sessions. These included several minutes of focusing on breathing and noticing sensations. Self-as-context tasks (e.g. "Who is doing the noticing?" [Harris, 2009]) were introduced into later mindfulness work. These aimed to help John notice that he can choose to struggle with thoughts or, alternatively, choose to accept his thoughts as thoughts and attend to what is important in the present moment.

Cognitive defusion tasks were used to help John disengage from his thoughts as literal events and to broaden his behavioural repertoire to include disengaging from analysis. These tasks comprised an exercise about "buying junk thoughts" (Harris, 2009); John was also asked to practise saying: "There goes that old … story again" when his mind was giving him analyses about his chest pain and dizziness or fears regarding his stroke.

Steps were taken to encourage John gradually to broaden his behavioural repertoire to include more psychologically flexible behaviours. For instance, he was encouraged to begin practising mindfully engaging in television programs as a way to help introduce behaviours that could help him connect to the present.

Results and progress

Figure 2 shows John's DASS scores across the period of intervention. John had a steep improvement in his mood to Session 7, perhaps as the result of living more fully. His depression and stress symptoms then deteriorated slightly; he explained this in terms of "attacks of depression" at weekends (see "Complicating factors", below). Between the start and end of therapy, John's anxiety scores moved steadily from 'extremely severe' to 'mild'; his depression scores from 'moderate' to 'mild'; and his stress scores from 'extremely severe' to 'moderate'. He also reported that his chest pain had ceased by Session 7, though his dizzy spells remained.

By Session 4, John had returned to work. He experienced a clear improvement in psychological flexibility across the period of the intervention (see Figure 3). His illness schema had changed by the end of therapy: he now believed his stroke to be permanent, but with fewer consequences, generating less concern. He also felt that he understood his illness to a lesser extent (see Figure 4).

8 Complicating factors

John's later "attacks of depression" were conceptualised as distress caused by newly available free time exposing a lack of valued activity in some life areas. In therapy these were put into the agenda of acceptance ("distress is normal – let's focus on values") but not considered in detail. They were perhaps not adequately addressed, and therapy could have been

extended to examine them. However, equally these "attacks of depression" may have indicated a fear of independence from the clinician, as they appeared after it was agreed that therapy was coming to an end. Thus it is unclear whether John would have been better served by extending the number of sessions, as this could have modelled dependence rather than helping consolidate his improvements.

Another complicating factor was John's previous negative experience of psychotherapy. Time was dedicated to helping him understand why cognitive therapy may not have been helpful for him, with the differences between traditional cognitive therapy and ACT explained. John was able to identify how the suggested (by cognitive therapy) distress-control and thought-monitoring methods may have been counter-productive, and this appeared to increase his motivation to try the ACT methods that were subsequently suggested.

While John showed improvement in anxiety, depression and stress across treatment, and his chest pain ceased, these ostensibly desirable outcomes are considered consequential from an ACT perspective, in which the focus is on acceptance of distress rather than its removal. Therefore, John's pleasure at the cessation of his chest pain was not reinforced, and he was reminded, through experiential tasks and psychoeducation, that the goal was to be as open to these experiences as possible, rather than to try to remove them.

9 Access and barriers to care

There were few obvious barriers to care in the present case. John was motivated to attend sessions and, given that this treatment was provided by the National Health Service (United Kingdom), which offers publicly funded medical care, there were no financial barriers. There was no explicit limit on the number of sessions which could have been offered to John. Although cognitive impairment post-stroke may be a barrier for some patients, John had likely experienced only minor cognitive consequences and these did not appear to affect his progress

in psychotherapy. The intervention was predominantly administered by a novice therapist (CG), under the supervision of an experienced clinician (JG) with an emerging interest in ACT. The department benefited from regular group supervision sessions in ACT, from a qualified ACT trainer (DG), which facilitated our confidence in applying this novel approach.

10 Follow-up

John attended clinic for a follow-up appointment two months after therapy had finished. He reported that he was continuing to use the methods taught to him, and that he had found them to be helpful. He also reported that his mood was not currently problematic. However, change had occurred in John's conceptualisation of his stroke. He said that his medical doctor had suggested that his diet was a contributing factor to his stroke, and had subsequently begun a strict diet, of which he was keeping daily records. Though understandable, this rigorous response to diet control may have indicated a resurgence of inflexible responding to his situation. John was encouraged to contemplate how an agenda of control might impede valued-living, the goal being to exact a useful change in diet that would not undermine flexible goal-pursuit in valued activity. Unfortunately, questionnaires were not administered at this time-point; this is a limitation of the present case study as it means that we cannot be sure that the improvements John made during the intervention were maintained.

11 Treatment implications of the case

In support of the opinion of Kangas and McDonald (2011), albeit in a single-case study, this first reported evaluation of ACT for post-stroke anxiety returned encouraging results. John responded well to the intervention, becoming more psychologically flexible in response. Despite not being a target for treatment nor a treatment goal, his anxiety improved considerably and consistently across the period of the intervention. This is the paradox of ACT: despite an

explicit and theoretically consistent focus on not trying to eliminate unwanted private events, it appears from many of the ACT clinical trials that in fact these features do reduce (Hayes et al., 2006).

In line with the key difference between ACT and traditional cognitive therapy, cognitive restructuring was not used in this intervention. Despite this, a substantial shift in illness perceptions regarding stroke was observed (Figure 4). This exposes an important point in the debate about the utility of ACT in comparison to cognitive therapy: while improvements in outcomes may be mediated by different processes (improved flexibility versus changes in adaptive beliefs; see Arch & Craske, 2008), these processes may be inter-related – since the target of the intervention, psychological flexibility, improved but illness perceptions also changed. The potential relationship between psychological flexibility and illness perceptions has implications for clinicians working with chronic illness. Illness perceptions predict outcomes in people with debilitating chronic illness (Petrie & Weinman, 2012; Graham et al., 2014): while these perceptions are often quite extreme, they can be accurate. Thus a cognitive-restructuring approach may not be viable, since objective evidence may support extreme perceptions. However, a clinical focus on improving psychological flexibility may have the unintended effect of inducing beneficial illness schemata, even schemata which may be hard/impossible to induce using 'factual' evidence. Ironically, it is thus possible that ACT may cause more efficacious/ restructuring of cognitions than does cognitive restructuring. What remains to be established is whether change to cognition in parallel with increased psychological flexibility is an epiphenomenon or in fact a mediator of successful treatment. The ACT model would suggest the former; cognitive theory the latter. Future research would do well to conduct longitudinal experimental analyses of these factors in response to different types of intervention.

12 Recommendations for clinicians and students

ACT might represent an effective way to treat post-stroke anxiety, and it may have several benefits over traditional cognitive therapy. Larger-scale controlled trials are now required to discern the efficacy of ACT for post-stroke anxiety. ACT may also be useful in addressing medically unexplained symptoms co-existing with stroke (there is emerging evidence that related conditions respond to ACT [Eilenberg, Kronstrand, Fink & Frostholm, 2013; Jourdain & Dulin, 2009]). In the present case, the tasks designed to help John open up and accept his chest pain (e.g. non-judgemental observation and paradoxically asking John to *increase* his chest pain) appeared to precede positive shifts in his experience of his medically unexplained symptoms, and his ability to function effectively in their presence.

John may have responded well to ACT because it provided him with an experience that felt very different to cognitive therapy, which had previously been ineffective. Thus, while we suggest that ACT may be an effective a first-line treatment, given its distinctive features it might also function well as a second-line treatment for those who have not responded to cognitive therapy. Differences between therapies can be discussed and made explicit to enhance a patient's experience of these therapies as distinct.

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Tables and figures

Table 1. Description of the intervention techniques used, their timing and the aspects of psychological inflexibility which they target

Sessions	Processes promoted	Intervention Techniques	Examples of intervention techniques
1- 9	- Values - Acceptance	- Psycho-education	- Creative hopelessness - Experiential tasks: John was given two minutes and told not to think of a white polar bear; he thought only of polar bears for these two minutes; parallels were then drawn between this and his anxiety and medically unexplained symptoms. - Anxiety framed in the context of values: anxiety is the bi-product of meaningful activity as it can indicate that you care about a given outcome. Metaphors: white polar bear; thoughts like naughty child.
2 - 9	- Contact with the present moment	- Mindfulness (experiencing the present moment)	- Experiential tasks: several minutes focusing on sensations in the here and now (sounds, somatosensory feelings, sights), not thoughts; learning to allow thoughts to happen but to come and go; not 'hook you'. John was given weekly mindfulness homework tasks Metaphors: thoughts as leaves on the stream; thoughts as cars on a road.
3 - 9	- Self-as-context	- Mindfulness (observer self)	- Experiential tasks: for example, asking who is doing the noticing during mindfulness tasks.
4 - 9	- Cognitive defusion	-Defusion tasks	- Experiential tasks: for example, 'junk thoughts': John asked to generate negative evaluations; notice what behaviour believing these thoughts leads to; 'I am having the thought that…' or 'there goes that old x story again' put before negative evaluations to show thoughts as thoughts.Defusion tasks were also given as homework. Metaphors: mind as unscrupulous used-car salesman
5 - 9	- Acceptance (opening – up)	- Opening up to chest pain	- Experiential tasks: John was asked to pay full attention to his chest pain; he was asked to describe its colour, shape etc. He was asked to 'have a good look at it' but without trying to understand it or get rid of it. Asked to find ways to personify his chest-pain using imagination. Metaphors: chest pain as an annoying flat-mate; chest pain as an annoying character from a film.

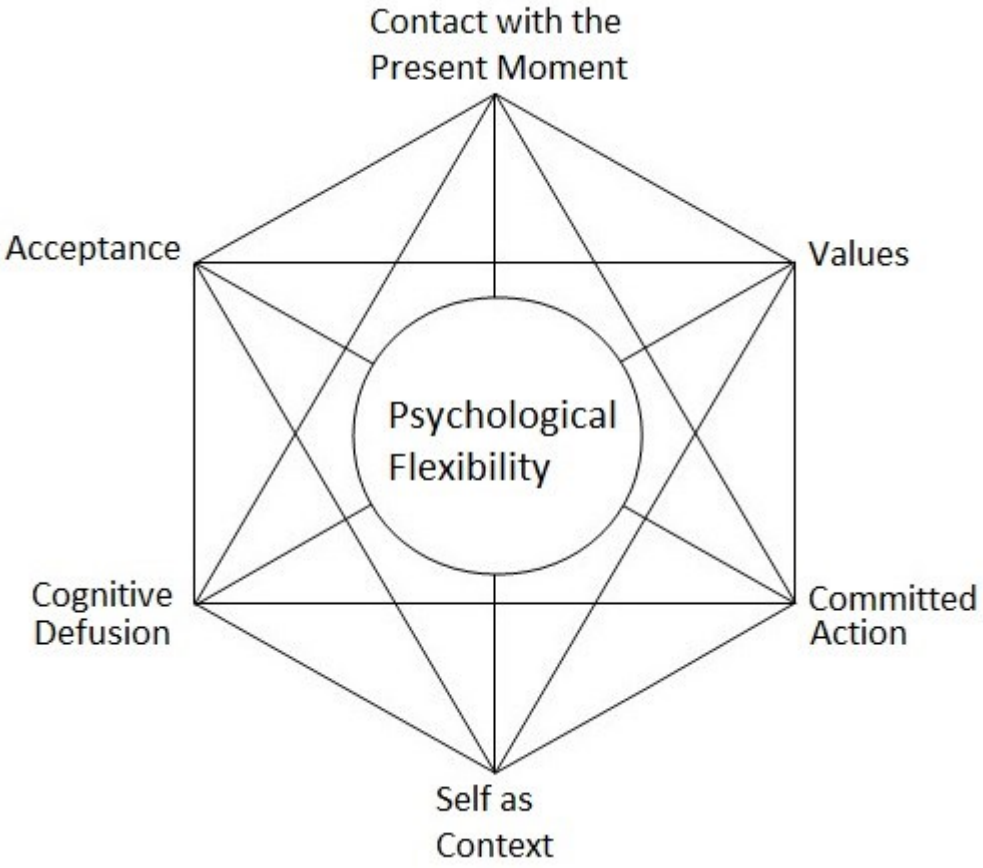

Figure 1. Diagram showing the proposed processes underlying psychological flexibility (Hayes et al., 2006)

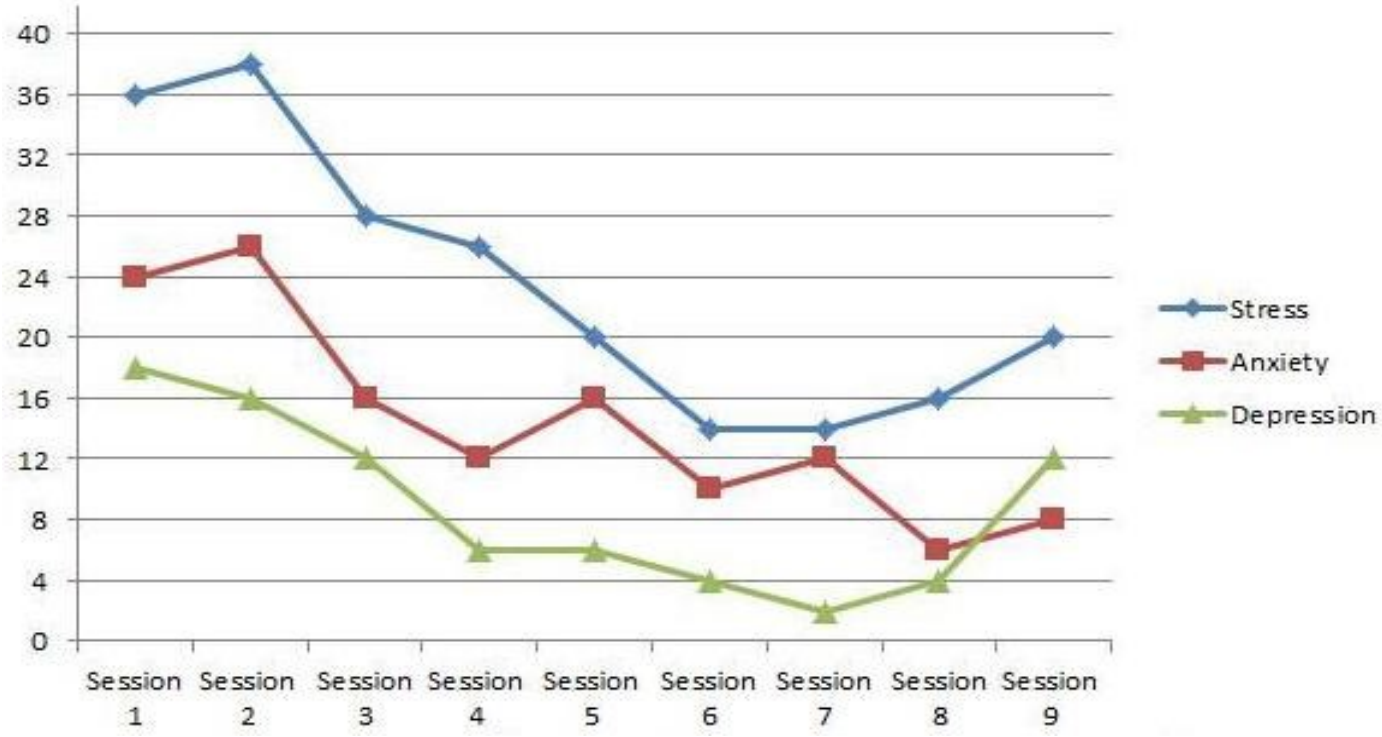

Figure 2. DASS-21 scores at each session of the intervention

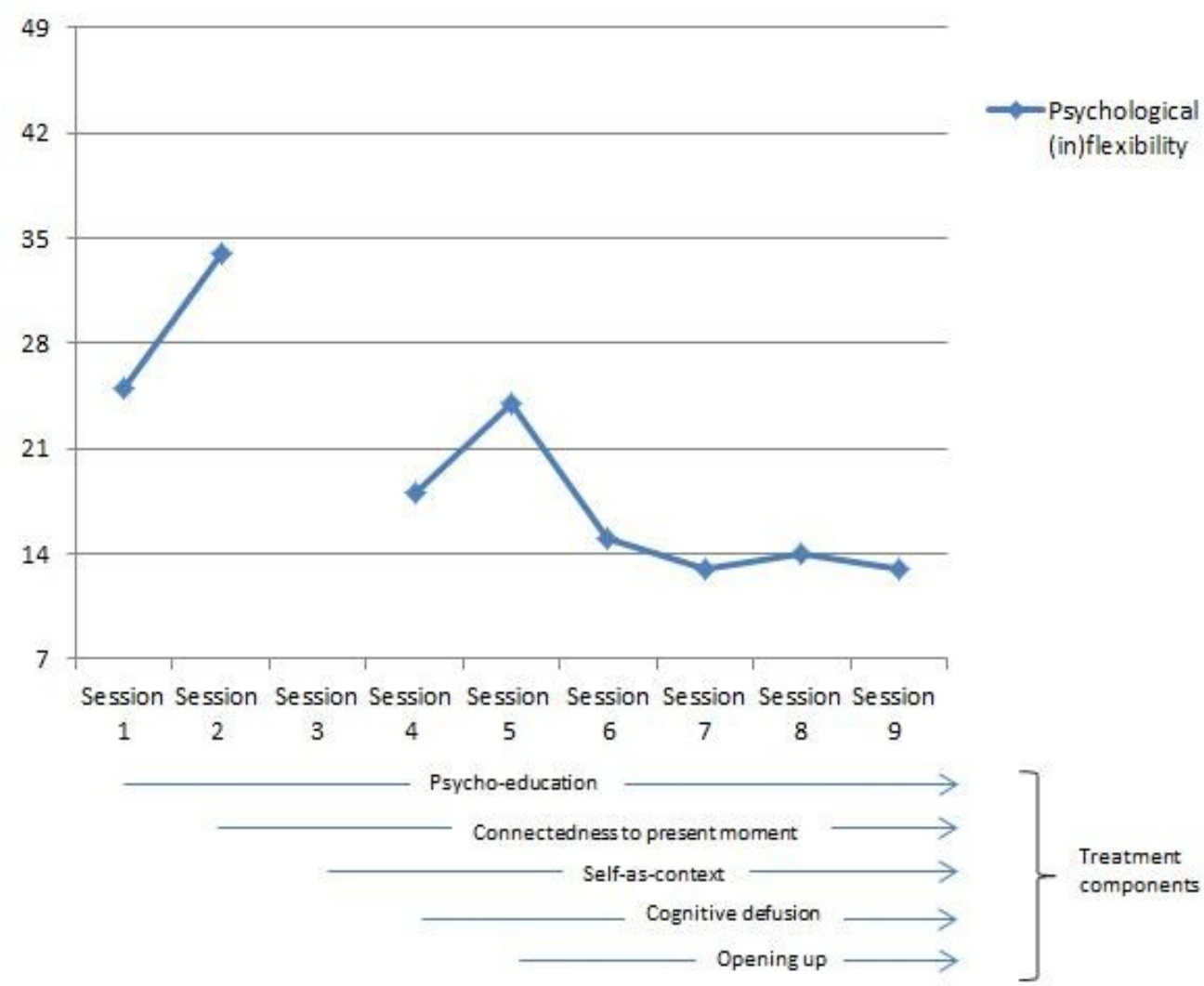

Figure 3. Psychological flexibility scores (AAQ-II) at each session of the intervention; the order of intervention techniques is also illustrated.

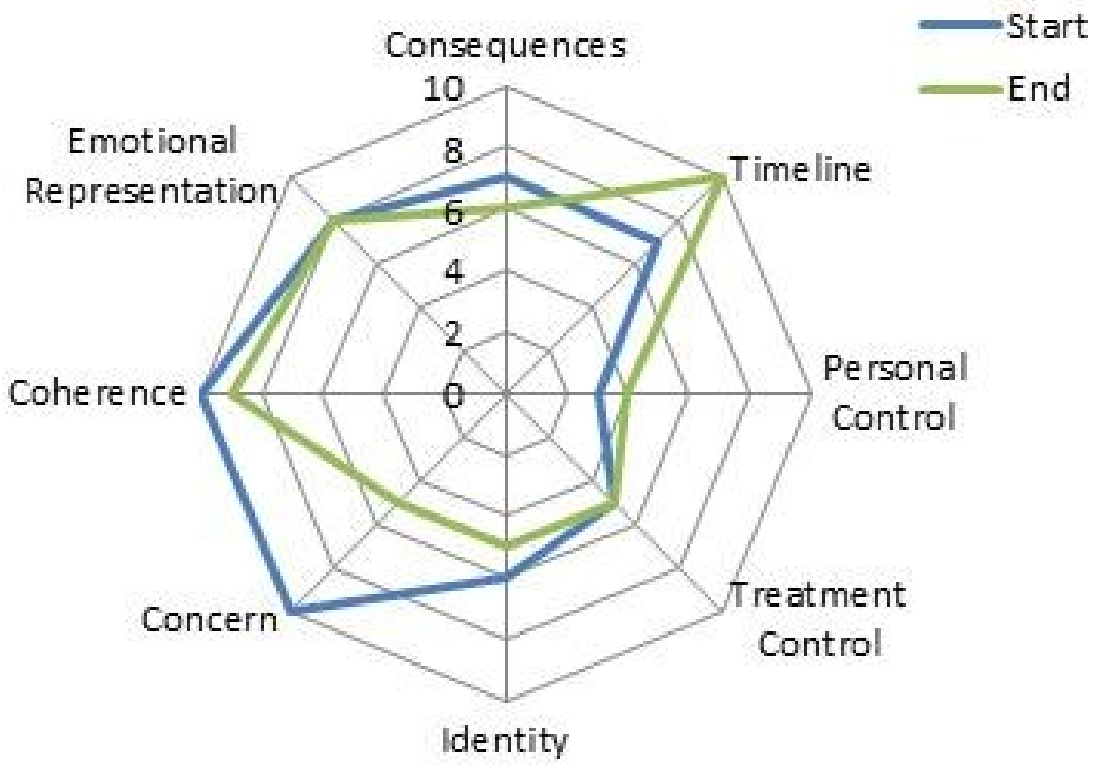

Figure 4. John's illness schemata (Brief IPQ) at the start and the end of therapy (Session 1/ Session 9)