Research Project Portfolio

University of Nottingham
School of Medicine
Division of Psychiatry & Applied Psychology

Doctorate in Clinical Psychology

2019

Examining ACT Process Measures with Cognitive Interviewing

Jessica Wright, BSc, MSc

Submitted in part fulfilment of the requirements for the
Doctorate in Clinical Psychology

Acknowledgements

I would like to thank Dr Nima Moghaddam and Dr David Dawson for their continued support and guidance during this research project and throughout the write-up process. Thank you for listening to me when I told you I work best according to deadlines and making sure we had regular meetings scheduled so I would work extra hard in the run-up. I would also like to thank all the people who took time out of their busy lives to participate in the research, kindly welcoming me into their homes and being so open and honest in their responses. Without their valuable insights this project would not have been possible. A special thanks to my Mum for helping with proof reading. Your constant correction of my grammar as I was growing-up meant I knew you were the right woman for the job. A final great big thanks goes to Chris and little Ellis for providing some light relief at home and their extra-long trips to the swimming pool or park to give me some time to work on my thesis when I needed it most.

Table of Contents

Research Project Portfolio 1
Acknowledgements 2
Table of Contents 3
Portfolio Abstract 5
Statement of Contribution 7
Journal Paper 8
Title Page 9
Abstract 10
Acceptance and Commitment Therapy 11
ACT Process Measurement 12
Cognitive interviewing 13
Aims 14
Methods 15
Participants 15
CI Procedure 15
Self-report instruments 17
Analysis 19
Results 22
Participant characteristics 22
CompACT CI results 23
Idiosyncratic Responses or Issues with CompACT items 27
AAQ-II CI Results 31
Idiosyncratic Responses or Issues with AAQ-II items 32
Discussion 34
Strengths and Limitations 39
Conclusion 40
References 41
Extended Paper 46
Introduction 46
Acceptance and Commitment Therapy and Overview 46
Clinical Application of ACT 52
A Comment on ACT Process Measures 56
Self-Report Instrument Testing 60
Cognitive Interviewing 63
Aims 68

Method 68
Ontological and Epistemological Position 69
Randomisation 72
Rationale for and Process of Analysis Approach 72
Analytical syntheses 75
Reflexivity 75
Analysis of Differences Between Retrospective and Concurrent Groups 77
Results 77
Concurrent versus Retrospective CI 77
Additional CI Results 79
Discussion 111
Extended comments on responses to items 1 and 4 on the AAQ-II 111
Further Comments Relating to Low Frequency Issues 113
Comments on Measurement of Psychological Flexibility 113
Concurrent versus Retrospective CI 114
Additional Comments Regarding Strengths and Limitations 116
Recommendations for Future Research 117
Implications for Clinical Practice 118
Contribution of Work 118
Critical Reflection 119
References 124
Appendices 138
Appendix 1 – Ethics Approval Letter 139
Appendix 2 – Participant Information Sheets 140
Appendix 3 – Consent Form 146
Appendix 4 – Flexible Cognitive Interview Schedule of Prompts 149
Appendix 5 - CompACT 151
Appendix 6 – AAQ-II 152
Appendix 7 – DASS-21 153
Poster 154

Portfolio Abstract

Acceptance and Commitment Therapy (ACT) proposes that psychological distress manifests as experiential avoidance (the behaviour of moving away from or avoiding perceived negative thoughts, feelings, and physical sensations) which can lead to a reduction in personally meaningful pursuits. A primary focus of ACT is to reduce experiential avoidance by promoting psychological flexibility. With ACT being used more widely in clinical practice and research, it is important that instruments measure processes as intended. Cognitive interviewing (CI) is an established applied qualitative method for examining and improving the validity of psychological measures. Utilising concurrent or retrospective interview techniques, the method examines how individuals interpret, understand, and respond to psychometric items, to determine whether they target expected domains and processes. The study had four aims: (1) To explore how respondents understand, interpret, and respond to items of the CompACT and the AAQ-II; (2) To explore how responses on the CompACT and the AAQ-II correspond with the intended ACT processes being measured and how these relate to the literature relating to psychological flexibility; (3) To highlight any areas of response error or problems with items on the CompACT and the AAQ-II; (4) To compare any differences in responses between the concurrent and retrospective CI groups. Twenty-six ACT-naïve individuals completed both measures and took part in either retrospective or concurrent cognitive interviews. Responses to all CompACT items corresponded with its putative three-factor conceptualization of psychological flexibility. Responses to six AAQ-II items corresponded with concepts of experiential avoidance and committed action; mapping for one item was unclear. Low frequency problems (e.g., unclear wording) were found with items on both measures, and both appeared to target intended (but varied) ACT constructs. No clear difference was found between the two CI groups (retrospective or concurrent). Findings seemingly support the CompACT as a conceptually broader measure of psychological flexibility, while the AAQ-II appears more targeted on experiential avoidance-related domains. The study

adds to the discussion about CI methodology and best practice guidelines for the approach.

Statement of Contribution

The initial project idea was devised by Dr Nima Moghaddam and Dr David Dawson following the development of the CompACT with the aim of testing this measure further. I then contributed to the project design in collaboration with Dr Nima Moghaddam and Dr David Dawson, my research supervisors on the project. I completed the application for ethical approval, wrote the review of the literature, and recruited participants (with some support from Dr Nima Moghaddam and Dr David Dawson). I collected the data by carrying out interviews with participants and administered questionnaire measures. I then transcribed these interviews, scored the questionnaires, and entered the data. I analysed the data and this was then reviewed by Dr Nima Moghaddam and Dr David Dawson to facilitate quality assurance.

Journal Paper

The following journal paper has been prepared in a format ready for submission to the Journal of Contextual Behavioral Science. Journal guidelines can be found at https://www.elsevier.com/journals/journal-of-contextual-behavioral-science/2212-1447?generatepdf=true.

Title Page

Title: Examining ACT Process Measures with Cognitive Interviewing

Authors: Jessica Wright[1], David Dawson[2*] & Nima Moghaddam[2]

[1]University of Nottingham, UK

[2]University of Lincoln, UK

*Corresponding author: Trent Doctorate in Clinical Psychology, Sarah Swift Building, University of Lincoln, Lincoln, LN6 7TS. Email: ddawson@lincoln.ac.uk

Abstract

Cognitive interviewing is an established applied qualitative method for examining and improving the face and content validity of psychological measures. Utilising concurrent or retrospective interview techniques, the method examines how individuals interpret, understand, and respond to psychometric items, to determine whether they target expected domains and processes. We aimed to examine respondents' verbal responses to items within the CompACT and AAQ-II (given their use in clinical research and practice) in order to determine whether/how these responses correspond with ACT targets. Twenty-six ACT-naïve individuals completed both measures and cognitive interviews. Responses to all CompACT items corresponded with its putative three-factor conceptualization of psychological flexibility. Responses to six AAQ-II items corresponded with concepts of experiential avoidance and committed action; mapping for one item was unclear. Low frequency problems (e.g., unclear wording) were found with items on both measures, and both appeared to target intended ACT constructs. Findings seemingly support the CompACT as a conceptually broader measure of psychological flexibility, while the AAQ-II appears more targeted on experiential avoidance-related domains.

Acceptance and Commitment Therapy[1]

Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) is based upon the principle of functional contextualism (Biglan & Hayes, 1996) which postulates that no thought, feeling, or sensation is inherently problematic as it depends upon the context in which it resides. The focus of ACT is not to reduce "symptoms" of distress but instead to alter the relationship a person has with such "symptoms". This poses a problem for measurement of ACT processes in a number of ways. The use of psychometric measures is mechanistic in nature, i.e. focused on measuring how dysfunction can be "fixed", which does not fit with ACT's philosophical approach. Furthermore, psychometric measures are static in nature whereas ACT relies upon context specific processes indicative of a more dynamic approach of measurement. Hayes, Barnes-Holmes, & Wilson (2012) acknowledge that measurement of ACT processes can be problematic using psychometric measures derived from classical test theory; however, they assert the importance of measurement to inform treatment or research utility so that interventions are appropriately targeted and outcomes enhanced. They also note that psychometrics can provide information about consistencies in action and contextual regulation through response patterns. There is also a wider issue with the extent to which specific ACT processes can be measured due to difficulty in operationalising or defining processes, particularly from the perspective of those not socialised to the ACT model. For example, defusion or self as context can be difficult to operationalise when unfamiliar with ACT, potentially posing a problem for ACT process psychometrics used as baseline measures.

[1] For a detailed overview of ACT see pages 46-56 of the extended paper.

ACT Process Measurement[2]

Measurement provides the foundation of evidence-based practice. Process-measurement in ACT is important to test the core hypotheses and principles of ACT interventions and broader theorising of the importance of psychological flexibility to functional outcomes. There are a number of general self-report measures of psychological flexibility that have been developed and tested within the literature. This study focuses on two such measures; the most widely-used measure of ACT processes (the AAQ-II; Bond et al., 2011) and a more recently developed measure that aims to address conceptual issues with the AAQ-II and purports to offer a more comprehensive measure of ACT processes (the CompACT; Francis, Dawson, & Golijani-Moghaddam, 2016).

The original AAQ was developed as a stand-alone measure of experiential avoidance (Hayes et al, 2006). Internal consistency of the AAQ was found to be problematic resulting in an unstable factor structure owing to issues with comprehensibility and reliability. Developments within the ACT model included acknowledgement that experiential avoidance and acceptance were reflective of, but not fully representative of psychological inflexibility leading to a focus within ACT on psychological flexibility and its component processes. As a consequence, the AAQ-II was developed to improve psychometric consistency and attempt to capture broader psychological inflexibility (Bond, et al., 2011). The AAQ-II is the most used self-report outcome measure of ACT interventions. However, it has been argued the content of the AAQ-II does not adequately capture the breadth and scope of psychological flexibility (Francis et al., 2016) and that rather than measuring experiential avoidance as intended, the AAQ-II may actually function as a measure of psychological distress, resulting in construct overlap with distress measures (Wolgast, 2014). A finding confirmed in a study examining the construct validity of the AAQ-II, where the AAQ-II correlated more highly with the Depression Anxiety Stress Scale (DASS-21; Lovibond & Lovibond, 1995) than the Brief Experiential Avoidance Questionnaire (BEAQ; Gámez et al., 2014).

[2] For further information regarding ACT process measures see pages 56-58 of the extended paper.

The CompACT was developed as a general measure of psychological flexibility (and constituent sub-processes) in light of arguments the AAQ-II may not reflect the breadth and scope of this process as conceptualised within the ACT model. The measure shows good internal consistency and convergent validity – with CompACT-assessed psychological flexibility demonstrating theoretically-expected relationships with distress and wellbeing, consistent with predictions from the ACT model (Francis et al., 2016).

Cognitive interviewing[3]

Cognitive interviewing (CI) is a qualitative methodology focusing on cognitive processes used by respondents when completing questionnaires, thus identifying and analysing response or item errors (Beatty & Willis, 2007). Underpinned by cognitive theory, CI aims to understand the mechanisms underlying the response process. This process is commonly conceptualised by Tourangeau's (1984) four-stage model, outlining a sequence of processes when responding to a question; (1) comprehension of the question; (2) retrieval of the necessary information from long-term memory; (3) judgement about how to answer the question based on the information they have retrieved; and (4) response.

CI can be conducted concurrently alongside completion of self-report measures or retrospectively following completion of measures. CI comprises two methods: (1) "think aloud" and (2) verbal probing. "Think aloud" involves verbalisation of thought processes during questionnaire completion (e.g. 'tell me what you are thinking'), eliciting data about the cognitive processes occurring at the time of response (Ericsson & Simon, 1980). Verbal probes are designed to elicit how the respondent went about answering a questionnaire (e.g. 'I noticed you hesitated before you answered, what were you thinking about?'). These techniques are designed to complement one another (Collins, 2003).

Questionnaire testing is essential to ensure resulting data are representative of concepts being examined. Quantitative methods are extensively used to identify

[3] For more detailed information about CI, see pages 63-68.

problems and are highly regarded in the field of survey instrument design (DeMaio, Rothgeb, & Hess, 1998).[4] CI provides a unique contribution to questionnaire testing due to its focus on identifying problems relating to item comprehension and interpretation (potentially leading to response errors) from the respondent's perspective (Presser et al., 2004). Using CI to contribute towards measure development or validation is therefore likely to lead to self-report measures with better psychometric properties.

CI has not been previously applied to ACT process-measures, but could have implications for understanding and developing such measures, particularly as the processes and concepts within ACT can be quite difficult to measure. With ACT being used more widely in clinical practice and research, it is important that instruments measure constructs as intended. Understanding how these measures fare in terms of comprehensibility and interpretation will contribute to the growing area of ACT and ACT process-measurement tools, having implications for research and clinical utility.[5]

Aims

This study further examined the psychometric properties of the CompACT and AAQ-II using CI to understand how individuals respond to the measures and how respondent interpretations correspond with ACT processes. There were three aims: First, to explore how respondents understand, interpret, and respond to items of the CompACT and the AAQ-II. Second, to explore how responses on the CompACT and the AAQ-II correspond with the intended ACT processes being measured and how these relate to the literature relating to psychological flexibility. Third, to highlight any areas of response error or problems with items on the CompACT and the AAQ-II.

[4] For further details of self-report instrument testing procedures see pages 60-63.
[5] For the rationale for the focus on the AAQ-II and CompACT in the current study see pages 58-59 of the extended paper.

Methods[6]

Participants[7]

As the aim was to explore how individuals understand and interpret the CompACT and AAQ-II, it was crucial participants were naïve to ACT as central to ACT are principles and processes which when aware, can influence how a person might respond to the measures. Familiarity of ACT would result in responses focused less on understanding and interpretation of items, and more about understanding of the ACT model or experiences of ACT therapy. This was achieved by asking potential participants whether they had prior knowledge or experience of ACT prior to being recruited to the study. All participants confirmed ACT naivety on this basis. Participants were recruited from the general population through local advertisements and snowball sampling. Participants were selected to facilitate representation of a range of demographic groups where possible.

CI Procedure

CIs were conducted by the first author in a quiet, private room. Participants completed the DASS-21[8] (Lovibond & Lovibond, 1995) to examine the potential impact of distress on cognitive processing. Psychological distress is known to impact on cognitive processing particularly in terms of memory, processing speed, and executive functioning (Klein & Barnes, 1994; Klein & Boals, 2001; Snyder, 2013) therefore it was important to understand baseline levels of distress to provide context for responses.

CIs were semi-structured with questions and probes dependent on responses. A schedule of prompts was used as a guide based on examples from Willis (2005) and upon the nature of individual items in the measures. This guide comprised “think aloud” and verbal probing techniques and was used flexibly throughout CIs. Example prompts used can be viewed in Table 1[9].

[6] For details of the ontological and epistemological position of the research see pages 69-71.
[7] For further information of selection and recruitment, inclusion and exclusion criteria, and participant incentive, see pages 71-72.
[8] See Appendix 7 for the DASS-21.
[9] The full flexible guide of prompts can be viewed in Appendix 4.

Table 1. Example prompts used in CIs

Example CI prompts
"Tell me what you are thinking"
"What do you think the item is asking?"
"Do you feel this item is easy or not easy to answer?"
"What do you draw on to respond to this item?"
"What does that [concept] mean to you?"
"What comes to mind when you read that?"
"I noticed you hesitated then. What were you thinking?"

There is a lack of consensus regarding best practice of CI methodology (Wright, Moghaddam, & Dawson, 2019), therefore participants were randomly allocated based on a computer-generated random number sequence using block randomisation to one of two groups, concurrent or retrospective CI to explore any differences between these methods (results reported elsewhere[10]). In the first group; concurrent interviewing, participants were asked to fill out the CompACT and AAQ-II (the order in which these were presented was counterbalanced across participants) during which time, they were asked to verbalise their thought processes. Participants randomised to retrospective interviewing were asked to fill out the CompACT and AAQ-II in entirety (the order in which these were presented was counterbalanced across participants). Following completion of the first measure presented, the CI took place and participants were questioned about thought processes used to complete the measure for each item. This process was then repeated with the second measure. Interviews were recorded on a digital recording device and field notes made during each interview.

[10] For details of the additional 4th aim this point is in reference to see page 68. For details of the process of randomisation, see page 72. For how this data was analysed, see page 77. For results of this element of the study, please see pages 77-79. For discussion of findings see pages 114-116.

Self-report instruments

The CompACT[11] (Francis et al., 2016) and AAQ-II[12] (Bond et al., 2011) are both designed for self-completion. Items in both measures can be viewed in Table 2.

The CompACT was developed taking items from 11 existing ACT process measures or theoretically related processes. Delphi consensus methodology (Hsu & Sandford, 2007) was used to establish retention/exclusion of items based on rating thresholds defined a priori. The CompACT comprises 23-items covering three dyadic ACT processes: (1) Valued Action, (2) Behavioural Awareness, and (3) Openness to Experience which correspond to psychological flexibility (Hayes, Villatte, Levin, & Hildebrandt, 2011). Scoring is based on a seven-point Likert scale ranging from 0 (strongly disagree) to 6 (strongly agree). The total CompACT score generates a single index score of psychological flexibility, this can then be broken down into scores of the three dyadic processes. The CompACT demonstrates strong internal consistency with a Cronbach's alpha for the total 23-item score of .91. The CompACT positively correlates with the DASS-21 (r = .57-.65), with the highest correlation on the depression scale (.65).

The AAQ-II is a seven-item, one-factor measure of psychological inflexibility/experiential avoidance. Scoring is based on a seven-point Likert scale ranging from 1 (never true) to 7 (always true). Items for the AAQ-II were generated and selected using a panel of ACT researchers and practitioners and exploratory factor analysis. The AAQ-II shows strong internal consistency (α = .90) (Wolgast, 2014) and positively correlates with the DASS-21 (r = .49-.61), most strongly with the depression scale (.61).

Table 2. CompACT and AAQ-II items

CompACT Items
1. I can identify the things that matter to me in life and pursue them

[11] See Appendix 5 for the CompACT
[12] See Appendix 6 for the AAQ-II

2. One of my big goals is to be free from painful emotions
3. I rush through meaningful activities without being really attentive to them
4. I try to stay busy to keep thoughts and feelings from coming
5. I act in ways that are consistent with how I wish to live my life
6. I get so caught up in my thoughts that I am unable to do the things I most want to do
7. I make choices based on what is important to me, even when it is stressful
8. I tell myself that I shouldn't have certain thoughts
9. I find it difficult to stay focused on what's happening in the present
10. I behave in line with my personal values
11. I go out of my way to avoid situations that might bring difficult thoughts, feelings, or sensations
12. Even when doing the things that matter to me, I find myself doing them without paying attention
13. I am willing to fully experience whatever thoughts, feelings, or sensations come up for me without trying to change or defend against them
14. I undertake things that are meaningful to me, even when I find it hard to do so
15. I work hard to keep out upsetting feelings
16. I do jobs or tasks automatically, without being aware of what I'm doing
17. I am able to follow my long-term plans including times when progress is slow
18. Even when something is important to me, I'll rarely do it if there is a chance it will upset me
19. It seems I am "running on automatic" without much awareness of what I'm doing
20. Thoughts are just thoughts – they don't control what I do
21. My values are really reflected in my behaviour
22. I can take thoughts and feelings as they come, without attempting to control or avoid them
23. I can keep going with something when it's important to me

AAQ-II Items

1. My painful experiences and memories make it difficult for me to live a life

that I would value
2. I'm afraid of my feelings
3. I worry about not being able to control my worries and feelings
4. My painful memories prevent me from having a fulfilling life
5. Emotions cause problems in my life
6. It seems like most people are handling their lives better than I am
7. Worries get in the way of my success

The DASS-21 is a 21-item, short-form version of Lovibond and Lovibond's (1995) measure of distress across three domains; depression, anxiety, and stress. The DASS-21 shows strong internal consistency (α = .93) (Henry & Crawford, 2005). Example items for each subscale are: "I found it hard to wind down" (stress), "I was aware of dryness of my mouth" (anxiety), and "I couldn't seem to experience any positive feeling at all" (depression). All items are scored on a four-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time).

Analysis

Cognitive interview analysis[13]. Analysis was based on Knafl et al's (2007) approach to analysis of CIs. This comprised the following steps: Transcription, generation of analytical syntheses, analysis of analytical syntheses, and categorisation of idiosyncratic responses or issues with items. These steps are outlined below:

Transcription. The aim of CIs was to evaluate the CompACT and AAQ-II, therefore the unit of analysis was the measure-item, not the participant. Thus, a traditional participant transcript, typical of qualitative studies was not developed. Instead, sections of responses from each participant per each item were transcribed and entered onto a master spreadsheet. Limited demographic information was also included for context along with participant scores for each item and any additional information provided by field notes (for example, noting hesitation, re-reading of items, or non-verbal information pertinent to analysis).

[13] For the rationale for the approach to analysis see pages 72-75.

Analytical synthesis.[14] For each ACT process (valued action, behavioural awareness, openness to experience [CompACT], and experiential avoidance [AAQ-II]) being measured, a synthesis of participant responses (forming an integrative summary of interpretations of that process) was developed. To do this, for each process, each participant's response was reviewed to ascertain understanding of the item. This was then consolidated into a synthesis, drawing together descriptive themes of participant interpretations or understanding of the items, and what they drew on to respond. The format of the synthesis was intended to summarise overall responses to the items within the subscales, while effectively conveying convergent and/or divergent viewpoints.

Analysis of analytical syntheses. Once analytical summaries were complete, they were compared with the literature relating to psychological flexibility. A qualitative statement was developed to encapsulate the relationship between responses and ACT processes. The primary and secondary (if applicable) processes of psychological flexibility most strongly implicated for each item were then labelled.

Categorisation of idiosyncratic responses or issues. In addition to synthesising responses based on understanding and interpretations, data were also synthesised with regards to idiosyncratic responses which might be indicative of issues with items. The Question Appraisal System (QAS-99; Willis & Lessler, 1999) was designed for use as a categorical framework for evaluating survey items to identify and "fix" problems. The QAS-99 was considered as a framework to apply in this study; however, the categories within the QAS-99 did not appear to reflect or conceptualise distinctive responses or issues identified by participants. Problem categories identified by Knafl et al., (2007) drew some comparisons with idiosyncratic responses and potential issues highlighted in the current study. It is suggested that issues be assessed within the specific context of the measure which items belong to (Willis, Royston, & Bercini, 1991) therefore idiosyncratic responses or issues were

[14] For how syntheses were developed at the item level, see page 75.

categorised using a prospectively mixed, deductive-inductive approach using categories identified by Knafl et al., (2007) and categories specific to the CompACT and AAQ-II. These were consolidated into four categories: (1) limited applicability; (2) misreading of item; (3) difficulty defining or qualifying concepts; and (4) lack of consistency in verbal responses and item ratings. Idiosyncratic responses or issues were then classified as 'low frequency' (if the frequency was less than 15%) or 'high frequency' (if the frequency was more than 15%) based on criterion outlined by Fowler (1992) and Oksenberg & Kalton (1991).

Quality Assurance Process

The Critical Appraisal Skills Programme (CASP) qualitative research checklist (1999) was used as a quality assurance framework to guide the study. To assure a trustworthy approach to analysis and synthesis of data, analysis was carried out initially by the first author and reviewed by the second and third authors. This was then discussed and analyses revised or confirmed accordingly.

Reflexivity[15]

It is important to acknowledge that two of the authors of this article were the authors of the CompACT. To manage author bias, this implicit bias was made explicit and preferential responses or analysis monitored. It was also managed by the first author positioning themselves independently from both the CompACT and the AAQ-II to ensure analysis was not influenced by author bias.

[15] For further comments on reflexivity see page 75-77.

Ethical Considerations[16]

Ethical approval was obtained from the University of Nottingham Research Ethics Committee. Anonymity of participants was protected during transcription and analysis through use of participant numerical codes. Informed consent was sought for digital recording of interviews and for interview content to be used in publications. Participants were informed they could withdraw from the study at any time.

Results

Participant characteristics

Twenty-six participants took part in the study. Demographic information is presented in Table 3. Mean CI length was 39 minutes (range 21-68 minutes).

Table 3. Participant demographics

Variable	N (%)
Gender	
Female	15 (58)
Male	11 (42)
Age (years)	
20-34	12 (46)
35-49	4 (15)
50-64	6 (23)
65-86	4 (15)
Employment status	
Employed	18 (69)
Retired	7 (27)
Unemployed	1 (3)
Ethnicity	
White	24 (92)
Asian	2 (8)
DASS-21 Scores	

[16] See Appendix 1 for Ethics Approval Letter, Appendix 2 for Participant Information Sheets, and Appendix 3 for Consent Forms.

Depression	
Normal	20 (77)
Mild	1 (4)
Moderate	3 (12)
Severe	0 (0)
Extremely severe	2 (8)
Anxiety	
Normal	19 (73)
Mild	3 (12)
Moderate	2 (8)
Severe	1 (4)
Extremely severe	1 (4)
Stress	
Normal	14 (54)
Mild	3 (12)
Moderate	7 (27)
Severe	2 (8)
Extremely severe	0 (0)

CompACT CI results[17]

Valued action. Responses to all items on the valued action subscale corresponded with values or committed action, either as primary or secondary processes. Participants found it relatively easy to identify the things in life that mattered to them and how they would go about pursuing these, demonstrated in the following response to item 1 – 'I can identify the things that really matter to me in life and pursue them':

> *'I've given an awful lot of thought to the things that matter and I'm going for it. I've thought about what the next 10-20 years will bring and make it worthwhile.'* -Score = 6 (strongly agree)
>
> P11, aged 60, male, white, retired

[17] For detailed presentation of CompACT CI findings at item level see pages 80-101.

Responses also conveyed a sense of behaving in line with personal values, corresponding with the principle of valued action, exemplified by the following response to item 10 – 'I behave in line with my personal values':

> *'I'm the sort of person if something is not in my values I wouldn't do it just to make someone happy if it's something I think is not right'* - Score = 6 (strongly agree)
>
> P21, aged 65, male, Asian, retired

Openness to experience. Responses to seven of the openness to experience items corresponded with acceptance as a primary construct (items 2, 4, 8, 11, 13, 15, and 22). Responses ranged according to the degree of agreement with the statements, for example, the following response to item 2 – 'one of my big goals is to be free from painful emotions' was indicative of a higher level of acceptance:

> *'To have good emotions you have to have painful emotions. There's going to be painful emotions in life. I can't be free from that. You have to have bad to have good.'* Score = 2 (moderately disagree).
>
> P4, aged 50, female, white, employed

Responses also outlined how acceptance was difficult, demonstrated by the following response to item 22 – 'I can take thoughts and feelings as they come, without attempting to control or avoid them':

> *'If I'm completely emotive and not controlling my thoughts and emotions that's not constructive. People expect me to be rational.'* Score = 5 (moderately agree)
>
> P25, aged 35, male, white, employed

Responses to the two defusion items corresponded with this process, with responses showing the most divergence in scores, ranging in degree of agreement. Some participants conveyed a sense of detachment between

thoughts and their relationship to actions, for example, in the following response to item 20 – 'Thoughts are just thoughts – they don't control what I do':

> *'First thing that came to mind was around intrusive thoughts. Thoughts <u>are</u> just thoughts they don't mean anything. They don't control what you do.'* Score = 5 (moderately agree)
>
> P19, aged 23, female, white, employed)

In contrast, some participants talked about experience of attachment to thoughts and the impact on behaviour as can be seen in a response to item 6 – 'I get so caught up in my thoughts that I am unable to do the things that I most want to do':

> *'Are there things that cause you to be almost paralysed? Yes if I look at the last year I allowed the thoughts to paralyse me from doing the things I want to do.'* Score = 4 (slightly agree)
>
> P12, aged 62, female, white, retired

Some participants were unsure about the relationship between thoughts and behaviour, resulting in scores in the middle of the scale, demonstrated in the following response to item 6:

> *'It's the one answer I've sat right in the middle on. Some thoughts can control what you do but a lot of them don't. I'm on the fence.'* Score = 3 (neither agree nor disagree)
>
> P6, aged 40, male, white, employed

Responses to item 18 – "Even when something is important to me, I'll rarely do it if there is a chance it will upset me" corresponded with acceptance, but also with committed action, with responses focusing on 'what's important' and how this related to behaviour reflecting valued action:

> *'No, if it's important it's got to be done. It might be upsetting but there's a bigger goal. I'm thinking about why am I doing this? That's what motivates me.'* Score = 0 (Strongly disagree)
>
> P11, aged 60, male, white, retired

For item 8 ‘I tell myself I shouldn’t have certain thoughts’ some participants conveyed a sense of being accepting of their thoughts:

> *‘I don't have thoughts that I don't think I should have. I'm quite content with the person I am and how I feel about things. I don't ever question my thought process about something.’* Score = 1 (moderately disagree)
>
> P8, aged 30, female, white, employed

While others talked about the impact of social judgements on their thoughts, which introduced some lack of clarity about what some participants perceived the item to be relating to:

> *‘I do have things I think that I might think 'oh no don't think that' but as long as I don't say it its ok. It's usually thoughts about others rather than thoughts I'm having about myself that I think I shouldn't have. It's more about what's socially appropriate.’* Score = 1 (moderately disagree)
>
> P3, aged 28, male, white, employed

Behavioural awareness. Responses to each item on the behavioural awareness subscale corresponded to the concept of either mindfulness or contact with the present. Demonstrated in this response to item 3 – ‘I rush through meaningful activities without being really attentive to them’:

> *‘I can agree with that slightly. There are times when I know I'm not being very mindful and in the moment.’* Score = 4 (slightly agree)
>
> P9, aged 36, male, white, employed

This is also shown in the following response to item 19 – ‘It seems I am “running on automatic” without much awareness of what I’m doing’:

> *‘It’s rarely the case. It will happen in certain situations but generally I find being an attentive person I'm quite aware of what's going on around me. I find it difficult to switch my mind off. I'm too*

intrigued by what's going on.' Score = 1 (moderately disagree)

P6, aged 40, male, white, employed

With many participants focusing on the phrases "meaningful" or "what matters to me", responses to items 3 and 12 were also reflective of committed action. This is demonstrated in the following response to item 12 – 'Even when doing the things that matter to me, I find myself doing them without paying attention':

'I always try to stay attentive to the activities that I'm doing because if it's something you've chosen to do why wouldn't you pay attention to them? In particular if it's something that mattered to you, then it would be important to pay attention to what you're doing.' Score = 1 (moderately disagree)

P1, aged 32, female, white, employed

Idiosyncratic Responses or Issues with CompACT items

Idiosyncratic responses or issues were highlighted for eight of the 23 CompACT items. Findings are presented in Table 5.

Table 5. Idiosyncratic Responses or Issues with CompACT items

CompACT Item	Category	Definition	Frequency n	Example Quotations and Item Score Provided (Participant Number and Demographic Characteristics)
3. I rush through meaningful activities without being really attentive to them	Difficulty defining concepts	Comments noting difficulty operationalising the term “meaningful activities”	3	*‘I'm not sure what a meaningful activity really means. You go through life rushing about not thinking about anything. Difficult question.’* Score=2 (P14, aged 75, female, white, retired)
	Misunderstanding of item	Response suggesting the item has been misunderstood	1	*‘I didn't really get this one. Meaningful activities to me [are] spending time with family. I'd never rush for them to go. If they need me, I'll drop everything.’* Score=2 (P17, aged 20, female, white, unemployed)
12. Even when doing the things that matter to me, I find myself doing them without paying attention	Difficulty defining concepts	Comments noting difficulty operationalising “what matters to me”	3	*‘I find it really hard to define what matters to me. I don't have set things about what is important to me. I answered with a 3 because I was unsure about identifying what matters to me.’* Score=3 (P3, aged 28, male, white, employed)
13. I am willing to fully experience whatever thoughts, feelings and sensations come up for me, without trying to change or defend against them	Misreading of item	Misreading item as “defend them” rather than “defend against them”	8	*‘Does that mean I'm happy to express my feelings and sensations without having to justify them or defend them? Like if I could negotiate them in some way. I'm not certain I necessarily change them but I do think I need to defend or justify them. I often feel the need to justify.’* Score=2

				(P12, aged 62, female, white, retired) *'I've underlined the word 'defend'. This one was difficult for me because I was thinking about how sometimes I might defend the way I think or feel. I might say 'I feel like this because'. As soon as you use the word 'because' you're defending it aren't you?'* Score=4 (P7, aged 26, female, white, employed)
15. I work hard to keep out upsetting feelings	Inconsistency in responses	Verbal response inconsistent with item rating	3	*'I wouldn't say I work hard at it. Working hard - distraction, thinking about other things. I do something, I try and get rid of that thought but it's not something I work hard to get rid of that thought'* Score=3 (P9, aged 28, male, white, employed)
17. I am able to follow my long-term plans including times when progress is slow	Limited applicability	Comments noting difficulty relating to concept "long-term plans"	2	*'What's tricky is that I can't instantly relate to having long-term plans because I don't associate with having a long term plan or with monitoring any kind of progress against it. So that's hard to answer. It's in the middle because I can't agree or disagree'* Score=3 (P1, aged 32, female, white, employed)
	Inconsistency in responses	Verbal response inconsistent with item rating	1	*'Yes I agree. That's your objectives again'* Score=1 (P16, aged 86, male, white, retired)

19. It seems I am “running on automatic” without much awareness of what I’m doing	Inconsistency in responses	Verbal response inconsistent with item rating	1	*‘True. Well you're based in a routine. Routine things your brain goes into automatic.’* Score=3 (P16, aged 86, male, white, retired)
21. My values are really reflected in my behaviour	Difficulty defining/qualifying concepts	Comment about difficulty ascertaining whether values are reflected in behaviour	1	*‘I can't measure it so I answered it as a 3’* Score=3 (P16, aged 86, male, white, retired)
22. I can take thoughts and feelings as they come, without attempting to control or avoid them	Limited applicability	Comment relating to difficulty agreeing or disagreeing with the item	1	*‘I don't know. It’s asking you to sit and think about things and maybe if there was a longer period of time or there was more dialogue you might get to an actual answer for that but just sat here reading it and having a few minutes to reflect I don't really know.’* Score=3 (P26, aged 30, female, white, employed)

Note. Scoring criteria for the CompACT: 0 = strongly disagree, 1 = moderately disagree, 2 = slightly disagree, 3 = neither agree nor disagree, 4 = slightly agree, 5 = moderately agree, 6 = strongly agree.

AAQ-II CI Results[18]

Responses to most items corresponded with experiential avoidance with a focus on being in contact with bodily sensations, thoughts, and emotions and attempts (or lack of) to alter the form and frequency of such events. Responses to items 1 and 4 also corresponded with committed action with responses focusing on how painful experiences resulted in appreciation of what they value in life, demonstrated by the following response to item 1 – "my painful experiences and memories make it difficult for me to live a life that I would value":

> *'I think they influence how you go forward. I view them as learning things which actually help you to live a life you value.'* Score = 1 (never true)
>
> P13, aged 64, male, white, retired

Responses to this process also focused on the extent to which participants were open to experiencing private events and attempts to control these, for example, in the following response to item 2 – "I'm afraid of my feelings:

> *'Anxiety would be a feeling that I would need to manage and I would be afraid of it becoming unmanageable. But I'm not afraid of it. Because what I visualise when I think of being afraid is like, cowering down really low to something really scary. I'm cognisant of it, I'm aware that it may impose limitations on my life but I'm not afraid of it.'* Score = 4 (sometimes true)
>
> P1, aged 32, female, white, employed

It was unclear how responses to items 5 – "emotions cause problems in my life" and 6 – "it seems like most people are handling their lives better than I am" mapped onto ACT processes. Responses to item 5 ranged in their focus and scores tended to be in the middle of the scale, exemplified in the following quotation:

[18] For detailed presentation of AAQ-II CI findings at item level see pages 102-110.

'Other people's emotions affect your life but I don't think your own emotions do. Mainly it's other people. What their problems are. You get upset for them or worried about them. So I would say it's sometimes true because they do affect your life.' Score = 4 (sometimes true)

P22, aged 58, female, white, retired

Responses to item 6 also highlighted an issue with this item in terms of limited applicability and is therefore presented in the following section.

Idiosyncratic Responses or Issues with AAQ-II items

Idiosyncratic responses or issues were highlighted for three of the seven AAQ-II items. Findings are presented in Table 6.

Table 6. Idiosyncratic Responses or Issues with AAQ-II items

AAQ-II Item	Category	Definition	Frequency n	Example Quotations and Item Score Provided (Participant Number and Demographic Characteristics)
1. My painful experiences and memories make it difficult for me to live a life that I would value	Limited applicability	Comments about difficulty recalling painful experiences and memories or feeling as thought the item was not relevant to them	7	*'I feel like I don't have anything relevant to that question. Nothing. I read it and thought 'that's not me'.* Score=1 (P23, aged 28, female, white, employed)
4. My painful memories prevent me from having a fulfilling life	Limited applicability	Comments about difficulty recalling painful memories or feeling as though the item was not relevant to them	2	*'That's linking back to number one that I personally would struggle to quickly identify what I would be drawing upon as painful memories because I haven't got anything immediately that I would associate with that.'* Score=1 (P1, aged 32, female, white, employed)
6. It seems like most people are handling their lives better than I am	Limited applicability	Comments about difficulty comparing own life to others	11	*I don't know how you answer that. It's very difficult when you don't know most people.'* Score=2 (P2, aged 36, male, white, employed)

Note. Scoring criteria for the AAQ-II: 1 = never true, 2 = very seldom true, 3 = seldom true, 4 = sometimes true, 5 = frequently true, 6 = almost always true, 7 = always true.

Discussion[19]

The use of CI has the potential to assess content validity and reliability of self-report measures by assessing comprehensibility, relevance, and clarity of items. The CompACT was developed as a comprehensive measure of psychological flexibility (and constituent sub-processes) to offer an alternative to the AAQ-II, a widely used, but oft-criticised, one-factor measure of experiential avoidance. We aimed to use CI to assess how ACT-naïve respondents comprehended and interpreted these measures, how interpretations corresponded with intended ACT processes, and to highlight any areas of response error or problems with items on both measures.

This study provides a novel contribution to the field of ACT process measurement, through the use of CI, a form of qualitative inquiry where the goal is to seek in-depth understanding from the perspective of respondents, free from the constraints of pre-determined categories of conventional, quantitative methods of survey testing (Willis, 2015). This study therefore adds a unique, qualitative insight into how respondents understand and interpret items on the CompACT and the AAQ-II, where previous testing has been quantitative in nature.

Ensuring the CompACT and AAQ-II are comprehended and measuring ACT processes as intended has important implications for their use in both clinical practice and research (Collins, 2003). The current study provides further clarification regarding the CompACT's broad factor structure, largely in line with the original paper by Francis et al., (2016). For some items on the behavioural awareness and openness to experience subscales, valued action constructs were apparent in responses, suggesting a common thread of values throughout the measure. This is reflective of the ACT model, where acceptance, defusion, and contact with the present moment are steps toward leading a values consistent life rather than ends in themselves (Hayes et al., 2006). This finding is consistent with the ACT model in that core ACT processes are overlapping

[19] For further discussion of AAQ-II CI findings see pages 111-112.

and interrelated (Hayes et al., 2006) where the goal is to increase psychological flexibility. Overall, the findings are suggestive the CompACT provides a broad measure of psychological flexibility, across a range of ACT domains.

Results from the current study found most items on the AAQ-II corresponded with experiential avoidance, but not all, with it not being apparent how some items mapped onto ACT processes. This indicates a problem with the construct validity of the measure, despite the fact the AAQ-II has been found to have good internal consistency (Bond et al., 2011). This finding is consistent with other studies using CI to test the construct validity of existing measures where difficulties which were previously unnoticed were highlighted through qualitative methods (Belzer et al., 2013) therefore strengthening the rationale for the use of qualitative methods alongside quantitative methods in measure development and analysis as the different approaches have implications for the conclusions drawn about the validity (Buers et al., 2014). In the present study, participant responses to certain items focused more on experiences of distress or painful feelings as opposed to their *relationships* with distress and feelings, which is an important conceptual point to note about the definition of experiential avoidance (Vaughan-Johnston, Quickert, & MacDonald, 2017). Therefore the ability of the AAQ-II to capture experiential avoidance seemed circumscribed. This finding supports those of other studies assessing the construct validity of the AAQ-II (Rochefort, Baldwin, & Chmielewski, 2018; Tyndall et al., 2018) who found it was difficult to distinguish whether the AAQ-II functions as a measure of experiential avoidance or psychological inflexibility rather than as a measurement of distress. Furthermore, Bond et al., (2011) state the AAQ-II functions as a measure of psychological inflexibility, which is described as being rigidly ruled by avoiding unwanted internal events to the extent where contact with the present moment and values-based actions are reduced, thereby enhancing distress. It was not clear in the findings from the current study how participants were understanding and responding to AAQ-II items from the perspective of this process, as again, responses focused on experience of internal events, rather than a wider picture of how avoidance of such events may impact on values-based action and contact with the present moment. It therefore seems limited as a measure of psychological inflexibility and,

according to the responses of participants, serves as a measure of experiential avoidance to an extent, but mostly focuses on experiences of distress[20]. Much of the AAQ-II based evidence for relationships between psychological flexibility and outcomes of interest (or for psychological flexibility as a mediator of change) might be more precisely (and narrowly) understood in terms of willingness or unwillingness to experience negative feelings and thoughts.

There were some low frequency idiosyncratic responses or issues with the CompACT and AAQ-II highlighted by the current study. It is worth noting that some low frequency issues found on behavioural awareness and valued action subscale items on the CompACT were reflective of a lack of values clarification, something which would be expected of those unfamiliar with the ACT model or experience of ACT therapy. This does not necessarily point to unsuitability of those items, but conditionality of valued action and behavioural awareness items on values means some responses may be difficult to track until values are clarified, potentially posing a problem for pre-post measurement of ACT interventions[21].

High frequency issues were found for “my painful experiences and memories make it difficult for me to live a life that I would value” and “It seems like most people are handling their lives better than I am” on the AAQ-II. Despite some limited applicability for a number of respondents, responses to the former were found to correspond to experiential avoidance. This was contingent however on the occurrence of painful memories or experiences. Those who perceived such experiences and memories had occurred in their life found they could relate to the item, whereas those who felt they had not found this difficult to answer. This may still suggest measurement of experiential avoidance, as these responses may be reflective of acceptance, suggesting a level of tolerance to distress, which in itself is a means to engaging in valued behaviour and reducing experiential avoidance (Juarascio, Forman, & Herbert, 2010). For item 6 however, limited applicability related to a lack of clarity from some participants in terms of what the item was intending to address. Responses were found to

[20] See page 113-114 for further comment regarding measurement of psychological flexibility.
[21] For further discussion of low frequency issues see pages 113.

be varied in focus, making it unclear how this item related to experiential avoidance as the social comparison element seemed out of context. Literature highlights an association between experiential avoidance and dysfunctional cognitions related to social comparison (Mahaffey, Wheaton, Fabricant, Berman, & Abramowitz, 2013). Experiential avoidance has also been associated with increased self-focused attention (Glick & Orsillo, 2011). These links perhaps provide clarity about the presence of this item in the AAQ-II, however, participants in the current study found the focus of this item unclear.

One high-frequency issue was found for the CompACT item “I am willing to fully experience whatever thoughts, feelings and sensations come up for me, without trying to change or defend against them” where the item was misread to read “change or defend them” therefore missing out the word ‘against’. This resulted in a very subtle shift in responses, but one which is potentially conceptually important to discuss. Acceptance is defined as the active and aware embrace of internal experiences without attempts to change their frequency or form (Hayes et al., 2006). Participants who misread the item talked about justifying or defending their private experiences, something which resembles attempting to change their form by altering their impact. Ultimately, this error still led to responses that coincided conceptually with acceptance, however misreading appeared to change the emphasis of the item. It is therefore a point of consideration for the authors, whether this finding warrants item modification, perhaps by emphasising the word ‘against’, or whether as acceptance is still ultimately measured, modification is unnecessary.

It is important to consider the implications of both high and low frequency issues identified in the current study when using the CompACT and AAQ-II clinically and in research. While low frequency issues are often deemed acceptable (Forsyth, Rothgeb, & Willis, 2004), given that issues in comprehension may lead to inaccuracy in measuring ACT processes (which are already difficult to operationalise and measure) it may be important for the authors of the CompACT and AAQ-II to consider amending particular items in light of the current findings. Consideration would be particularly important in terms of the high frequency issues identified with one of the CompACT items and two of the

AAQ-II items. It may also highlight the need for further investigation of how these measures perform with respect to comprehension and interpretation in different populations using CI methodology to assess any consistency in identification of item problems.

The DASS-21 was completed by all participants to provide a baseline level of psychological distress, giving context for responses and an indication of cognitive processing at the time of CI due to the known relationship between high distress and impairments in cognitive processing (Klein & Barnes, 1994; Klein & Boals, 2001; Snyder, 2013). DASS-21 scores ranged, with most participants scoring below a clinical threshold, however, a small number of participants demonstrated higher scores, particularly in the domains of anxiety and stress. While there was no definite measure of how DASS-21 scores related to cognitive processing of participants, the researcher could use clinical judgement and review participant data to consider any differences in processing, difficulties in answering items, or difficulty verbalising cognitive processes which may have been impacted by levels of distress. For the participants who had higher DASS-21 scores, there seemed to be no difference in terms of how they engaged with the CIs, their time to complete the measures or respond, their thinking styles, or their use of judgement to weigh-up their answers. The literature suggests that psychological difficulties such as anxiety, depression, and life event stress can result in deficits in working memory, ability to problem solve, and executive functioning (Klein & Barnes, 1994; Klein & Boals, 2001; Snyder, 2013), on this basis, we might have expected to notice some differences in processing in those demonstrating higher scores, above a clinical threshold. Lovibond and Lovibond (1995) assert however that clinical cut-off scores are arbitrary, as depression, stress, and anxiety scores can vary along a continuum of severity. Scores therefore can be indicative of difficulty, but are not diagnostic or prescriptive and should be used alongside clinical judgement. Worth noting also, is that the participants who took part in the study were from a non-clinical sample, and those with higher scores were therefore not representative necessarily of those who might seek the support of services for psychological difficulties.

Strengths and Limitations[22]

The process of CI involves asking participants to spend a greater amount of time considering items than usual, resulting in a potentially artificial situation which may impact on the responses given. The impact of this was potentially mediated however through the use of two styles of CI, concurrent and retrospective, where the latter involved participants completing the measures in real-time.

Strengths of the study were the use of CI to complement quantitative methods of survey analysis, demonstrated by the fact that issues highlighted in the current study with respect to the AAQ-II were corroborated by findings from other quantitative studies (Francis et al., 2016; Tyndall et al., 2018; Wolgast, 2014). Furthermore, the focus of CI on the question-answer process, provided insight into the aspects of the response tasks which were problematic, potentially resulting in theoretically-driven solutions for item revisions. A further strength of the study was the use of CI to analyse the theoretical composition of the CompACT and AAQ-II in-depth from the perspective of ACT naive responders, something which not only provides helpful information in terms of these specific ACT process measures, but also provides a contribution toward the ACT literature more broadly.

It was intended that participants be naïve to ACT, however, this may be a limitation of the study in terms of how this is conceptualised and put into practice. While all participants were screened to ensure lack of knowledge and experience of ACT more broadly, there are elements of ACT which are more widely understood or are not unique to ACT. For example, mindfulness, which traditionally has its roots in Buddhism (Grabovac, Lau, & Willett, 2011) and is currently prolific in the form of mindfulness-based interventions (Cullen, 2011).

[22] For additional comments regarding strengths and limitations of the study, see pages 116-127.

Conclusion [23] [24] [25] [26]

This study demonstrates that errors and misunderstandings do occur while completing the CompACT and AAQ-II. While these were largely of low frequency, and therefore within the parameters of acceptable human error, it is recommended that the authors of both measures consider these items in light of the findings of the study. A strength of the CompACT is its length and multi-item-construct structure, meaning that should a problem occur with one item, it is likely respondents will go on to answer an item of the same construct with no problem, reducing the overall impact of the item of difficulty on the final score. Given the AAQ-II consists of only seven items, problems with items may have greater implications for the interpretation or clinical utility of AAQ-II scores. Findings support the CompACT as a conceptually broader, and more theoretically consistent measure of psychological flexibility, while the AAQ-II appears to focus on narrow aspects of psychological flexibility, largely experiential avoidance-related domains and also appeared to be misunderstood in other ways. This highlights the relative value of using the CompACT as a conceptually broad ACT process-measure in clinical practice and research.

[23] For recommendations for future research, see pages 117-118.
[24] For the implications of the research on clinical practice, see page 118.
[25] For comments regarding the contribution of the work see page 118-119.
[26] For a critical reflection of the research see pages 119-123.

References

Beatty, P. C., & Willis, G. B. (2007). Research synthesis: The practice of cognitive interviewing. *Public Opinion Quarterly, 71*(2), 287-311. Retrieved from https://doi.org/10.1093/poq/nfm006

Belzer, F., Schmidt, S., Lucius-Hoene, G., Schneider, J. F., Orellana-Rios, C. L., & Sauer, S. (2013). Challenging the construct validity of mindfulness assessment—a cognitive interview study of the Freiburg mindfulness inventory. *Mindfulness, 4*(1), 33-44. doi:10.1007/s12671-012-0165-7

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionniare - II: A revised measure of psychological flexibility and experiential avoidance. *Behavior Therapy, 42*(4), 676-688. Retrieved from http://dx.doi.org/10.1016/j.beth.2011.03.007

Buers, C., Triemstra, M., Bloemendal, E., Zwijnenberg, N. C., Hendriks, M., & Delnoij, D. M. (2014). The value of cognitive interviewing for optimizing a patient experience survey. *International Journal of Social Research Methodology, 17*(4), 325-340. doi:10.1080/13645579.2012.750830

Critical Appraisal Skills Programme (CASP), 1999. Ten questions to help you make sense of qualitative research. CASP, Oxford.

Collins, D. (2003). Pretesting survey instruments: an overview of cognitive methods. *Quality of life research, 12*(3), 229-238. doi:DOI: 10.1023/A:1023254226592

Cullen, M. (2011). Mindfulness-based interventions: An emerging phenomenon. Mindfulness, 2(3), 186-193. doi:10.1007/s12671-011-0058-1

DeMaio, T. J., Rothgeb, J., & Hess, J. (1998). Improving survey quality through pretesting. In Proceedings of the Section on Survey Research Methods. *American Statistical Association, 3*(1), 50-58. Retrieved from https://www.census.gov/srd/papers/pdf/sm98-03.pdf

Ericsson, K. A., & Simon, H. A. (1980). Verbal reports as data. *Psychological review, 87*(3), 215-251. doi:10.1037/0033-295X.87.3.215

Forsyth, B., Rothgeb, J. M., & Willis, G. B. (2004). Does pretesting make a difference? An experimental test. In P. P. Biemer, *Methods for testing and evaluating survey questionnaires* (pp. 525-546). New York: Wiley.

Fowler Jr, F. J. (1992). How unclear terms affect survey data. *Public Opinion Quarterly, 56*(2), 218-231. doi:10.1086/269312

Francis, A. W., Dawson, D. L., & Golijani-Moghaddam, N. (2016). The development and validation of the Comprehensive assessment of Acceptance and Commitment Therapy processes (CompACT). *Journal of Contextual Behavioral Science, 5*(3), 134-145. Retrieved from http://dx.doi.org/10.1016/j.jcbs.2016.05.003

Gámez, W., Chmielewski, M., Kotov, R., Ruggero, C., Suzuki, N., & Watson, D. (2014). The brief experiential avoidance questionnaire: development and initial validation. *Psychological assessment, 26*(1), 35-45. doi:10.1037/a0034473

Glick, D. M., & Orsillo, S. M. (2011). Relationships among social anxiety, self-focused attention, and experiential distress and avoidance. *Journal of Evidence-Based Psychotherapies, 11*(1), 1-12. Retrieved from https://search.proquest.com/openview/9771ceae967be124fde57e0a74fae2ef/1?pq-origsite=gscholar&cbl=28893

Grabovac, A. D., Lau, M. A., & Willett, B. R. (2011). Mechanisms of mindfulness: A Buddhist psychological model. Mindfulness, 2(3), 154-166. doi:10.1007/s12671-011-0054-5

Hayes, S. C., Barnes-Holmes, D., & Wilson, K. G. (2012). Contextual behavioral science: Creating a science more adequate to the challenge of the human condition. Journal of Contextual Behavioral Science, 1(1-2), 1-16. Doi:10.1016/j.jcbs.2012.09.004

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change.* New York; London: Guilford Press.

Hayes, S. C., Villatte, M., Levin, M., & Hildebrandt, M. (2011). Open, aware, and active: Contextual approaches as an emerging trend in the behavioral and cognitive therapies. *Annual review of clinical psychology, 7*(4), 141-168. doi:10.1146/annurev-clinpsy-032210-104449

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British journal of clinical psychology, 44*(2), 227-239. doi:10.1348/014466505X29657

Hsu, C. C., & Sandford, B. A. (2007). The Delphi technique: making sense of consensus. *Practical assessment, research & evaluation, 12*(10), 1-8. Retrieved from https://pareonline.net/getvn.asp?v=12&n=10

Juarascio, A. S., Forman, E. M., & Herbert, J. D. (2010). Acceptance and commitment therapy versus cognitive therapy for the treatment of comorbid eating pathology. *Behavior modification, 34*(2), 175-190. doi:10.1177/0145445510363472

Klein, K., & Barnes, D. (1994). The relationship of life stress to problem solving: Task complexity and individual differences. *Social Cognition, 12*(3), 187-204. doi:10.1521/soco.1994.12.3.187

Klein, K., & Boals, A. (2001). The relationship of life event stress and working memory capacity. *Applied Cognitive Psychology: The Official Journal of the Society for Applied Research in Memory and Cognition, 15*(5), 565-579. doi:10.1002/acp.727

Knafl, K., Deatrick, J., Gallo, A., Holcombe, G., Bakitas, M., Dixon, J., & Grey, M. (2007). The analysis and interpretation of cognitive interviews for instrument development. *Research in nursing & health, 30*(2), 224-234. doi:10.1002/nur.20195

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy, 33*(3), 335-343. doi:10.1016/0005-7967(94)00075-U

Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the depression anxiety stress scales 2nd edition.* Sydney: Psychology Foundation of Australia.

Mahaffey, B. L., Wheaton, M. G., Fabricant, L. E., Berman, N. C., & Abramowitz, J. S. (2013). The contribution of experiential avoidance and

social cognitions in the prediction of social anxiety. *Behavioural and cognitive psychotherapy, 41*(1), 52-65. doi:10.1017/S1352465812000367

Oksenberg, L., & Kalton, G. (1991). New strategies for pretesting survey questions. *Journal of official statistics, 7*(3), 349-365. Retrieved from https://search.proquest.com/openview/ed8c6deba86be86efdff0d32f74d5521/1?pq-origsite=gscholar&cbl=105444

Presser, S., Couper, M. P., Lessler, J. T., Martin, E., Martin, J., Rothgeb, J. M., & Singer, E. (2004). Methods for testing and evaluating survey questions. *Public opinion quarterly, 68*(1), 109-130. doi:10.2307/270979

Rochefort, C., Baldwin, A. S., & Chmielewski, M. (2018). Experiential avoidance: An examination of the construct validity of the AAQ-II and MEAQ. *Behavior therapy, 49*(3), 435-449. doi:10.1016/j.beth.2017.08.008

Snyder, H. R. (2013). Major depressive disorder is associated with broad impairments on neuropsychological measures of executive function: a meta-analysis and review. *Psychological bulletin, 139*(1), 81-132. doi:10.1037/a0028727

Tourangeau, R. (1984). Cognitive science and survey methods: A cognitive perspective. In. In M. S. Jabine, *Cognitive Aspects of Survey Methodology: Building a Bridge Between the Disciplines* (pp. 73-100). Washington, DC: National Academy Press.

Tyndall, I., Waldeck, D., Pancani, L., Whelan, R., Roche, B., & Dawson, D. L. (2018). The Acceptance and Action Questionnaire-II (AAQ-II) as a measure of experiential avoidance: Concerns over discriminant validity. *Journal of Contextual Behavioral Science*. doi:10.1016/j.jcbs.2018.09.005

Vaughan-Johnston, T. I., Quickert, R. E., & MacDonald, T. K. (2017). Psychological flexibility under fire: Testing the incremental validity of experiential avoidance. *Personality and Individual Differences, 105*, 335-349. doi:10.1016/j.paid.2016.10.011

Willis, G. B. (2005). *Cognitive interviewing: A tool for improving questionnaire design.* Thousand Oaks, CA: Sage.

Willis, G. B. (2015). *Analysis of the cognitive interview in questionnaire design.* New York: Oxford University Press.

Willis, G. B., & Lessler, J. T. (1999). Question appraisal system QAS-99. *National Cancer Institute.*, 1-85. Retrieved from https://www.researchgate.net/profile/Gordon_Willis/publication/267938670_Question_Appraisal_System_QAS-99_By/links/54b7b26a0cf2e68eb2803f6a.pdf

Willis, G. B., Royston, P., & Bercini, D. (1991). The use of verbal report methods in the development and testing of survey questionnaires. *Applied Cognitive Psychology, 5*(3), 251-267. doi:10.1002/acp.2350050307

Wolgast, M. (2014). What does the Acceptance and Action Questionnaire (AAQ-II) really measure? *Behavior Therapy, 45*(6), 831-839. doi:10.1016/j.beth.2014.07.002

Wright, J., Moghaddam, N., & Dawson, D. L. (in press). (2019). Cognitive Interviewing in Patient Reported Outcome Measures: A Systematic Review of Methodological Processes. *Qualitative Psychology*.

Extended Paper

Introduction

Acceptance and Commitment Therapy and Overview

In the journal paper, Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) was briefly outlined, with particular emphasis on the ACT definition of psychological flexibility and its six constituent sub-processes. In the following section, the philosophical and theoretical roots, core principles, mechanisms of change, and clinical application of ACT will be presented to supplement the introduction section of the journal paper.

Philosophical and theoretical roots of ACT. The philosophical and theoretical roots of ACT can be covered in great depth and detail. It is not necessary to present a highly detailed account here, however some brief background is provided for context of ACT.

ACT is based on the concept of functional contextualism (Biglan & Hayes, 1996), a form of philosophical pragmatism, which asserts that behaviour occurs within a context and has a purpose. Knowledge of this helps to predict behaviour and consider the function of behaviour in specific contexts. According to Hayes (2004), functional contextualism can be broken down into the following components; (1) focus on the whole event, (2) sensitivity to the role of context in understanding the nature and function of an event, (3) emphasis on a pragmatic truth criterion, and (4) specific scientific goals against which to apply that truth criterion. The adoption of the pragmatic truth criterion (based on James' pragmatic theory of truth; 1998) allows for the validity or "truth" of the analysis to be determined by its utility in context and whether it leads to effective action or goal achievement. The important point to note about ACT based on this philosophical stance is that as a result, psychological experiences (thoughts, feelings, and physical sensations) do not cause other actions in isolation, they are regulated by context (Hayes & Brownstein, 1986).

Theoretically, ACT has its basis in Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001). RFT is a behavioural theory of human language and cognition, explaining language's role in psychopathology and human suffering. This theory asserts that psychopathology develops as a result of the way language and cognition interacts with incidents in the environment (context) in the presence of an inability to persist or change with the long-term goal of meeting valued ends. This forms the basis of ACT, where the premise is that it is not the content of cognitions which lead to distress, but the context these cognitions occur in that can lead to problematic regulation of behaviour.

Core principles. ACT is an empirically based, trans-diagnostic intervention which aims to foster acceptance and valued living rather than elimination of difficult thoughts, feelings, or physical sensations (referred to in ACT as private events). ACT conceptualises psychological distress or suffering as occurring as a result of attempts to avoid unwanted or undesired private events (referred to as experiential avoidance) which results in a reduction in behaviour that is meaningful or valued. ACT sets itself apart from other approaches to psychological suffering as its focus on behaviour is dynamic, flexible, and contextually specific. The literature provides support for the ACT model in that vital for positive psychological health and wellbeing is commitment to meaningful challenges and passions (Kashdan & Rottenberg, 2010; Vallerand et al., 2003). The goal of ACT is to reduce experiential avoidance (which contributes towards psychological inflexibility), and increase psychological flexibility – the definition of which was described in the journal paper and therefore will not be repeated here again to avoid replication. Increasing psychological flexibility is the mechanism of change central to ACT.

As described briefly in the journal paper, psychological flexibility is comprised of six sub-processes: (1) acceptance, (2) defusion, (3) self as context, (4) present moment awareness, (5) values, and (6) committed action (Hayes et al., 2006). These sub-processes come together to form the Hexaflex in ACT (see Figure 1 later in section) and each will be described here in more detail.

Acceptance. Acceptance is presented in ACT as the opposite of experiential avoidance. Rather than avoidance of unwanted private events, the concept of acceptance proposes the "active and aware embrace of those private events occasioned by one's history without unnecessary attempts to change their frequency or form, especially when doing so would cause psychological harm." (Hayes, Luoma, Bond, Masuda, & Lillis, 2006, page 7). This sub-process therefore emphasises an open approach to private events. This is an important theoretical point to note with ACT, where the goal is not to reduce the experience of unwanted private events (as is the case with other psychotherapeutic models) but rather foster experiential openness where private events are experienced fully without defence or struggle. Acceptance is not considered an end-goal in ACT but a step towards increasing values consistent behaviour.

Cognitive defusion. Cognitive defusion refers to trying to change the way people interact with or relate to their thoughts. This works on the premise that fusion to thoughts can be problematic and lead to psychological inflexibility. Interventions to increase cognitive defusion aim to reduce the literality of thoughts thereby weakening the power of thoughts. The purpose of cognitive defusion is to foster acknowledgement of the true nature of thoughts, notice patterns of thinking rather than becoming caught up in them, and respond to thoughts based on workable action (adopting the pragmatic truth criterion – i.e. what works rather than what is true; Harris, 2006). Through this process, individuals learn to recognise that thoughts do not dictate behaviour (the opposite of which is thought-action-fusion) and notice when thoughts are preventing values-based living. As with acceptance, it is not about reducing the frequency of thoughts, rather the goal is to decrease the believability or attachment to thoughts such that values-consistent behaviour can take place and experiential avoidance is reduced.

Present moment awareness. Present moment awareness refers to an open and receptive awareness of the here and now, approached with curiosity and interest. ACT endorses a non-judgemental stance to present moment awareness, where psychological and environmental events are experienced as

they are without attempts to change their frequency of their form. This process also promotes increasing the direct experience of the present moment, thereby increasing flexibility. This process links with the concept of mindfulness, an important component of ACT which is also an important part of its clinical application, fostering full engagement with present moment actions, reducing the tendency to become “caught up” in thoughts, and allowing experience of private events to be as they are without judgement. This also involves a shift in the perspective of sense of self with respect to “self as process” which encapsulates this process of paying attention to and experiencing private events as they occur.

Self as context. Self as context forms the basis of the rationale for developing ACT, and is the concept that we are not the content of our experiences but rather our sense of self is bound in the verbal knowledge of our context. We can become tied to private experiences, believing thoughts, feelings, and sensations define who we are, thus impacting on behaviour and reducing psychological flexibility. It is important in ACT to foster a sense of self as context to allow for an awareness of experiences but doing so without attachment or judgement, linking to the previous sub-processes of defusion and acceptance. As with present moment awareness, self as context is facilitated in ACT through mindfulness based interventions and by increasing experiential openness.

Values. As suggested by the philosophical and theoretical roots of ACT, the goal of ACT is to increase personally meaningful behaviour derived from personal values. This involves clarifying what is significant and meaningful to a person, how they wish to be and what they hope to stand for. These values can never be objectively obtained, but can be substantiated in present moment behaviour. ACT uses many exercises to facilitate values clarification and living a values consistent life is facilitated through cognitive defusion, acceptance, and present moment awareness.

Committed action. Committed action involves setting goals linked to clarified values and carrying them out in the service of living a meaningful life.

This process links with principles of behaviour change in behavioural therapy and also links with the concept that successful behaviour change is more likely when occurring in a meaningful context. While it was outlined in the previous section that values can never be fully obtained or accomplished, values-based goals can be achieved through committed action. This process is facilitated by, and helps to facilitate acceptance, cognitive defusion, present moment awareness, and self as context. Committed action involves both persistence and change through engaging in a range of values-based behaviours, helping to foster flexibility. These sub-processes do not function independently from one another, rather each provide support for each other, helping to facilitate psychological flexibility. For example, it would not be possible to achieve present moment awareness without also being able to accept private experiences. Similarly, one cannot use committed action without first having an awareness of personal values. As outlined by the Hexaflex (see Figure 1) these processes can be clustered into two overarching groups; mindfulness and acceptance based approaches and commitment and behaviour change processes.

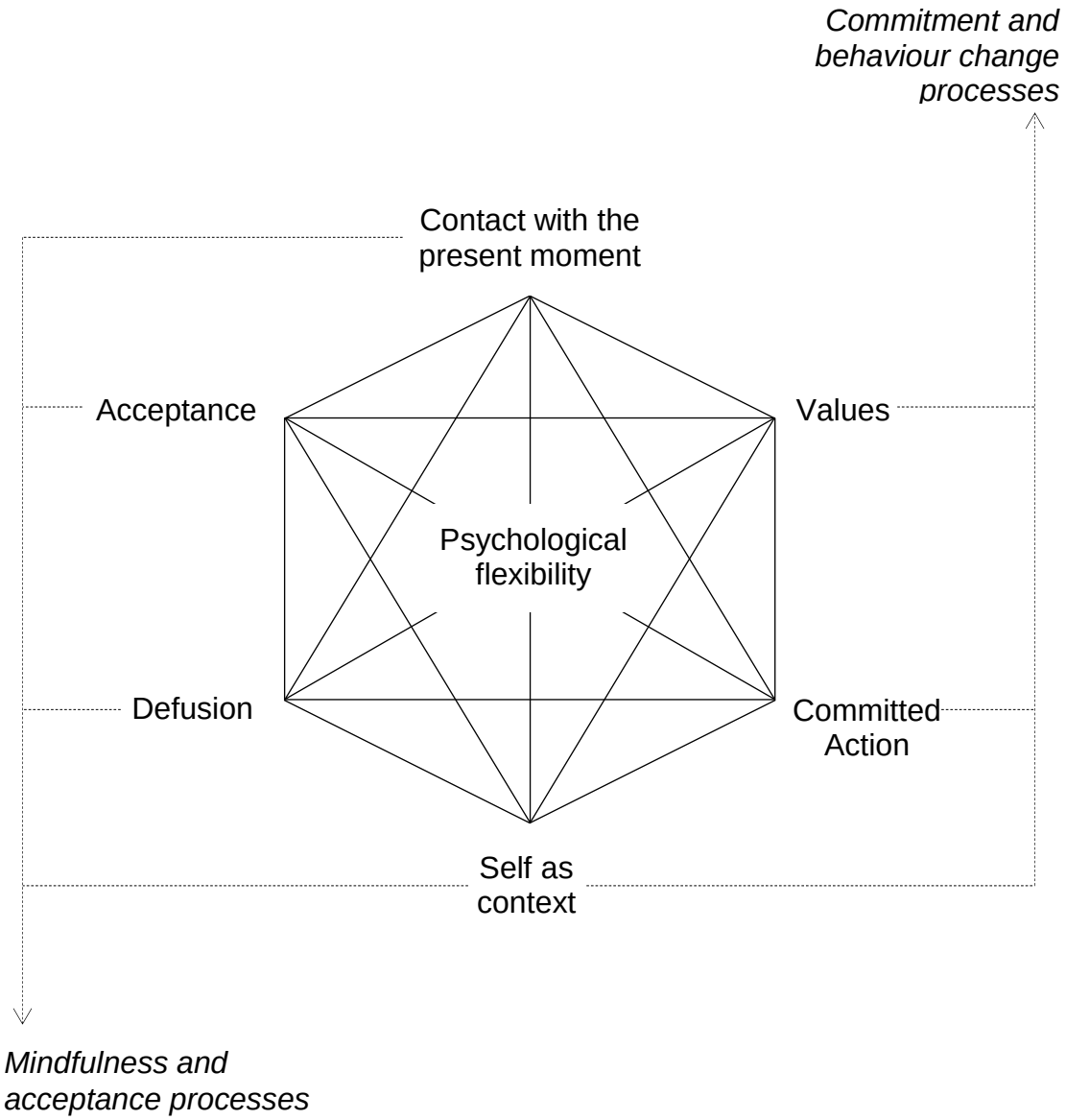


Figure 1. ACT Hexaflex: A model of the psychological processes of ACT (Hayes et al., 2006)

Clinical Application of ACT

ACT is a trans-diagnostic approach which is used clinically in a wide range of areas including; chronic pain (Hann & McCracken, 2014), depression (Powers, Vörding, & Emmelkamp, 2009), anxiety (Bluett, Homan, Morrison, Levin, & Twohig, 2014), substance use (Lee, An, Levin, & Twohig, 2015), and long-term conditions (Graham, Gouick, Krahe, & Gillanders, 2016). The most recent systematic review and meta-analysis assessing the efficacy of ACT generally across all presentations reports a growing body of evidence for its utility in recent years with the review including 60 randomised controlled trials (RCTs) on a range of clinical presentations (Öst, 2014). Furthermore, a recent systematic review and meta-analysis was carried out to assess the efficacy of ACT interventions specifically on depression, anxiety, and/or psychological flexibility (French, Golijani-Moghaddam, & Schröder, 2017). While the review found that ACT self-help interventions show beneficial effects, particularly when clinician or therapist guidance is more frequent, they also found that the RCTs included were small in number, heterogeneous in nature, and demonstrated small effect sizes, rendering conclusions tentative. Nevertheless, ACT continues to be a well-used approach and is garnering more interest in terms of empirically assessing outcomes. Vital to continuing to develop the evidence base for ACT is effective and psychometrically sound process measures, providing further rationale for the current study. For ACT to continue to be tested and assessed, it is important measures are functioning in a way that is helpful and expected.

Within ACT, a number of techniques are utilised to bring about therapeutic change and exemplify ACT ideas and principles. There are many examples of these, which would be too extensive to list here, however, these are comprehensively outlined in Hayes et al., (1999). The most widely used technique in ACT however, is metaphor, which is used to facilitate visualisations, develop cognitive defusion, and bring about therapeutic change. An extensive selection of ACT metaphors can be found in Stoddard and Afari (2014).

Therapeutically, ACT is delivered in a number of stages, outlined below:

Creative hopelessness. In this stage, the ways in which the client has attempted to solve the problems which have brought them to therapy are explored. Within this exploration, the ways in which these solutions have been unhelpful are also explored which usually leads to uncovering that solutions have actually taken the form of experiential avoidance strategies (Blackledge & Hayes, 2001). Through this, the therapist establishes "creative hopelessness" which helps the client to notice that previous solutions or methods of coping with difficulties can be viewed as part of the problem. This also involves a re-framing of sorts, so that aversive experiences are not viewed as the problem themselves, but the problem exists as a result of unintended consequences of attempts to avoid aversive private events. With previous solutions now being recognised as unhelpful, this helps to foster openness to potential new actions and behaviours. There are a number of methods of establishing creative hopelessness. Hayes and Wilson (1994) list these as use of paradox, confusion, metaphor, and affirmation of the underlying fears about hopelessness.

Viewing attempts to control private events as the problem. In this phase of ACT, the focus is on how attempts at emotional and cognitive control can function as a barrier to resolution of the presenting problems. Control is often viewed as a method of coping with unwanted private events, however, it is important to help clients understand how control relates to their difficulties. Part of this phase is to impart knowledge about socialisation of control in relation to our thoughts and feelings through what we are told, for example phrases like "don't worry about it" or "don't cry". We can also be socialised into the concept of control through modelling from caregivers or significant individuals. It is also important in this phase to remove blame by emphasising how some efforts to control private events can be adaptive or effective in the short-term but when problems are persistent or circumstances unlikely to change, this strategy becomes problematic.

Establishing self as context rather than content. This stage of therapy involves fostering a shift from a sense of self which is inextricably linked

to experiences of private events (e.g. “I don’t think I can do this”) to a separation of the sense of self “I” from thoughts, feelings, and physical sensations. This helps a person create distance between themselves and the problem or difficulty they want to reduce, thus supporting the development of self-awareness and a perspective of the world based on the self, not on the problem behaviour (1984). To achieve this, the therapist guides the client in experiential exercises and also uses metaphors (a common technique in ACT). Techniques to foster defusion are also used to facilitate this separation of self from thoughts, feelings, and behaviours. Hayes and Wilson (1994) describe a commonly used metaphor in their article looking at altering the verbal support of experiential avoidance which helps to exemplify this stage:

> In the metaphor, the client's private events (both negatively and positively evaluated) are said to be like pieces on a chess board. Within this metaphor, the counterpart for "self as context" is not the chess pieces (the content) but the board itself. If the client is observing events "from piece level," certain pieces on the board may be obscured or altogether invisible depending on their placement on the board. The board, however, is fully in contact with all of the pieces. It is also worth noting that pieces on the board may threaten one another: A white piece such as "I'll get through this" may be threatened by a large black queen shouting "Not in this lifetime!" The board, however, contains and is fully in contact with, but not threatened by, any piece, be it positive or negative. (p294-295)

Choosing and valuing a direction. Often, at the beginning of therapy, the focus of client goals is usually removal of what the client views as the problem, for example, to not feel depressed or anxious. After spending time working with a client on the previous stages discussed, avoidance patterns are recognised, and the client begins to be less likely to focus on being rid of the problem as they originally saw it, and more focused on valued outcomes. The therapist helps to guide the client to clarify their values and a direction with which to choose in life. Therapists do this by asking clients to examine what matters to them across many domains such as, family, relationships, career,

spirituality, and community participation. An important part of this is helping clients to identify values which transcend concrete goals. In his book The Happiness Trap, Harris (2007) presents some useful techniques and activities to use with clients when helping them to choose and value a direction, such as, the life values questionnaire, the willingness and action plan, and the bull's eye (clarifying your values).

Letting go of the struggle and embracing symptoms. The fifth stage of ACT involves encouraging the client to release the reigns on their experiential control and asking them to embrace what they consider the symptoms of their difficulty, usually what brought them to therapy in the first place. It is important here to note that theoretically, the focus of ACT in this stage is not on exposure, where eventual habituation to previously avoided private events may occur. The focus instead is on giving up the struggle and experiencing the thoughts, feelings, and/or sensations as they are, without attempting to change or avoid them. This process sets in motion a change, where private events no longer result in avoidance and therefore lose their power. In terms of clinical techniques, the therapist uses imagery or particular exercises to highlight avoided thoughts, feelings, and sensations in the therapy room. The client then experiences how it feels to not avoid such private events and can practice letting go of attempts to control them.

Commitment and behaviour change. In the sixth component of ACT, the aim is to help the client develop commitments to action, based on values clarified in earlier sessions. Behaviour change in the context of ACT focuses on commitments to behaviour change leading to positive consequences, as opposed to those which perpetuate difficulties such as experiential avoidance. It is vital that commitments to action are grounded in values to ensure action and behaviour is meaningful for the client. Values based interventions have been linked with improved quality of life, decreased levels of distress, increased sense of personal meaning, and positive long-term outcomes (2015).

The therapeutic relationship. As with all applications of psychological models, the therapeutic relationship is vital in the application of ACT. Therapists

help to convey ACT ideas and principles through modelling those ideas and principles themselves. Emotional containment is also vital, helping facilitate the notion that the client's private events can be tolerated and experienced for what they are, rather than judged or avoided. Through openness, the therapist can help the client to understand patterns of behaviour which may be contributing to difficulties, and encourage clients to understand the role of avoidance in their distress. The context with which many client difficulties begin is often interpersonally, particularly in terms of experiential avoidance which is often learned. It is therefore important that the therapeutic relationship does not serve to reinforce difficulties established interpersonally. As ever with psychological work, an effective therapeutic relationship is vital for the client to feel able to show vulnerability in front of the therapist, which is fostered through an environment of compassion and care by the therapist, which in turn models something important to the client about the therapists own values and values-based behaviours (Wilson & Sandoz, 2008).

A Comment on ACT Process Measures

In the journal paper, the fact that there are some general self-report measures of psychological flexibility was briefly mentioned but not elaborated on beyond mention of the AAQ-II and CompACT as these were the measures of focus in the study. In the following section, further information will be detailed regarding additional published ACT process measures and also some discussion about population-specific ACT process measures.

The Acceptance and Action Questionnaire (AAQ). The AAQ (Hayes et al., 2004) was the predecessor of the AAQ-II. It was designed as a measure of experiential avoidance and psychological inflexibility using nine or 16 (depending on the version) items answered on a Likert-type scale. The AAQ was widely used and a meta-analysis of studies using the AAQ to measure outcomes found it had predictive ability at assessing quality of life outcomes (Hayes et al., 2006). Due to its perceived success, it has also been adapted for use in specific settings and with particular populations (this will be discussed later in this section). Problems with the internal consistency of the AAQ were

raised however, with testing revealing an alpha coefficient of .70 and test-retest reliability at .64 over four months (Hayes et al., 2004). Furthermore, other studies have reported lower alpha levels suggesting a lack of internal consistency and robustness of this unidimensional measure (Bond et al., 2011). Bond et al., (2011) attributed difficulties with the AAQ to item complexity and that the concepts being measured were subtle and potentially difficult to capture. As a result, the AAQ-II (Bond et al., 2011) was developed which is discussed in the journal paper and therefore will not be reiterated here.

The Avoidance and Fusion Questionnaire for Youth (AFQ-Y). The AFQ-Y (Greco, Lambert, & Baer, 2008) is a 17-item or 8-item short form measure of psychological inflexibility conceptualised by cognitive fusion, experiential avoidance, and inaction or behavioural ineffectiveness designed for use with children and young adults. It has been tested to assess its suitability for use in adult populations however, with findings demonstrating the AFQ-Y showed better incremental validity than the AAQ-II in predicting psychological symptoms (Fergus et al., 2012). Furthermore, Fergus et al. (2012) also found the AFQ-Y demonstrated adequate internal consistency, convergent and divergent validity, and concurrent validity. Its suitability for use with children and young people also meant that it was found to be a more accessible measure than some others in terms of reading level.

The Multidimensional Experiential Avoidance Questionnaire (MEAQ). The MEAQ (Gámez, Chmielewski, Kotov, Ruggero, & Watson, 2011) is a 62-item measure of experiential avoidance. The MEAQ includes six subscales; (1) behavioural avoidance, (2) distress aversion, (3) procrastination, (4) distraction/suppression, (5) Repression/denial, and (6) distress endurance. The measure has been found to have good internal consistency, convergent, and divergent validity. Despite this, it has come under criticism for its length, and therefore a 15-item, short-form version was developed called the Brief Experiential Avoidance Questionnaire (BEAQ; Gámez, Chmielewski, Kotov, Ruggero, Suzuki, & Watson, 2014).

Multidimensional Psychological Flexibility Inventory (MPFI). The MPFI (Rolffs, Rogge, & Wilson, 2018) is a 60-item, self-report inventory designed to assess the six dimensions of psychological flexibility ((1) acceptance, (2) contact with the present moment, (3) values, (4) committed action, (5) self as context, and (6) defusion) and the six dimensions of inflexibility ((1) experiential avoidance, (2) dominance of the conceptualised past and feared future, (3) lack of values clarity – dominance of pliance and avoidant tracking, (4) inaction, impulsivity, or avoidance persistence, (5) attachment to the conceptualised self, and (6) cognitive fusion) from the Hexaflex model (See Figure 1; Hayes et al., 2006). The measure therefore consists of 12 subscales scored from one to six on a Likert-type scale. Higher scores represent higher levels of the dimension being assessed. The average scores of the six psychological flexibility MPFI processes can be calculated, giving a score of global psychological flexibility. The averages of the six psychological inflexibility scores can also be calculated to give a global inflexibility score. The MPFI demonstrated significantly higher levels of internal consistency than the AAQ, AAQ-II, and the AFQ-Y. Furthermore, confirmatory factor analysis verified global psychological flexibility and inflexibility higher order factors correlated at -.735, suggestive of closely related processes.

Population-specific ACT process measures. The AAQ is a widely used measure which has led to a number of population specific versions being developed as the popularity of ACT has grown. There are many examples of these, but a few of these include specific versions for chronic pain (McCracken, Vowles, & Eccleston, 2004), diabetes (Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007), and coping with psychosis (Shawyer, Ratcliff, Mackinnon, Farhall, Hayes, & Copolov, 2007).

Rationale for Study of the AAQ-II and the CompACT

The above section demonstrates the presence of other ACT process measures meaning it is therefore important to present the rationale for why the AAQ-II and the CompACT were chosen as the focus of this study.

Like the AAQ and AAQ-II, the MEAQ and BEAQ have a focus on experiential avoidance, one component of psychological flexibility. The AFQ-Y also focuses on experiential avoidance, but also on fusion. None of these measures therefore set out to measure psychological flexibility from the perspective of all the processes of ACT. The MPFI on the other hand does function as a broad measure of psychological flexibility. Perhaps raising the question for why it was not chosen as a focus in the current study. The MPFI was published more recently than the CompACT, and while it functions similarly to the CompACT in terms of a broad global measure of psychological flexibility, the CompACT was chosen as the focus of study as the MPFI remains less widely used and cited at present than the CompACT which is gaining more interest currently.

The AAQ-II remains the most widely used and cited process measure of ACT (apart from the AAQ, on which the AAQ-II was based). It is the outcome measure used by most RCTs examining the efficacy and use of ACT. As discussed in the journal paper however, it comes under much criticism in terms of its validity. It is also used as a broad measure of psychological flexibility generally, as opposed to a measure of experiential avoidance (and therefore psychological inflexibility) as intended. The CompACT is a relatively new ACT process measure, which is currently gaining interest both clinically and from a research point of view. The CompACT purports to be a broad measure of psychological flexibility and constituent processes and was developed on the basis of the AAQ-II's shortcomings. Authors of the CompACT concluded that further validation work would be useful to carry out with respect to the CompACT (Francis, Dawson, & Golijani-Moghaddam, 2016). The AAQ-II and the CompACT were therefore chosen as two contrasting process measures of ACT, but both being used in similar ways in clinical settings and in research.

Self-Report Instrument Testing

In the journal paper, the value of the practice of testing the psychometric properties of instruments was briefly outlined. Discussion then took place about the benefits of using qualitative methods of self-report instrument testing alongside traditional, usually quantitative methods. In the following section, additional information will be presented to provide clarity around traditional validity and reliability testing methods.

Using measurement tools that are psychometrically sound is vital for undertaking and completing rigorous research. Validity and reliability testing therefore facilitates assurances about the integrity of measures. Well reported studies will outline how validity and reliability has been ascertained, which allows researchers and clinicians to make decisions about the utility of an instrument.

Validity. Validity is the ability of the instrument to measure the characteristics of the construct under scrutiny. Trochim and Donnelly (2001) describe the concept of validity under the broad type of construct validity, which is then split into two further subtypes of construct validity; translational validity and criterion validity.

***Construct validity*.** Construct validity represents the degree to which an instrument measures the intended construct (Cronbach & Meehl, 1955). For construct validity to be upheld, the items within the instrument must be related to operationalised theoretical concepts. ACT process measurement tools can be used to illustrate this point. For example, if an ACT instrument intended to measure psychological flexibility, it could be considered to demonstrate construct validity if the items in the instrument were found to measure concepts which are theoretically and structurally linked to psychological flexibility. On the other hand, if that same measure also had the ability to measure concepts which were not closely related to psychological flexibility, for example, distress, this may suggest a lack of construct validity in terms of this instruments performance as a measure of psychological flexibility alone.

***Translational validity*.** According to Trochim & Donnelly (2001), Translational validity encompasses face and content validity. Face validity is usually a fairly easy way of establishing some level of construct validity of an instrument and is therefore an established and well-reported finding in validity testing publications. Face validity is a subjective measure of construct validity, which aims to assess whether at face value an instrument measures the intended construct. While it is often seen as a less robust indication of construct validity (Elasy & Gaddy, 1998) it provides a good indication of how respondents may interpret or respond to instruments. Content validity measures the extent to which an instrument is representative of all aspects of a construct. Using the example again of an ACT process measure of psychological flexibility, one such measure may lack content validity if it measured the ability to be in contact with the present moment, but failed to measure values based behaviour. Establishing content validity can be facilitated in the development process through the use of a number of steps such as clearly defining concepts to be measured with the literature and generating a pool of items which can then be reviewed and refined by a panel of experts (McKenzie, Wood, Kotecki, Clark, & Brey, 1999). A notable example of this is the Delphi method (Hsu & Sandford, 2007) where a pool of items is reviewed by a panel of experts and items refined over iterative rounds of analysis to ensure items are reflective of all facets of the construct.

Criterion validity. Criterion validity measures the extent that an instrument predicts the outcome of another variable. It is therefore a test of predictive performance or behaviour. For example, responses on a psychological flexibility instrument could be validated by correlations with other measures of psychological health (e.g. stress or wellbeing) as the literature asserts a relationship between higher levels of psychological flexibility and improved psychological health (Kashdan & Rottenberg, 2010). Criterion validity is broken down into varying subtypes. Trochim and Donnelly's (2001) model comprehensively indicates four subtypes of criterion validity; (1) concurrent validity, (2) predictive validity, (3) convergent validity, and (4) discriminant validity.

Concurrent validity. Concurrent validity measures the extent to which the instrument in question compares to an existing, well-established test. It can also assess the instrument when used concurrently with two groups at the same time. This method is often criticised however for its lack of predictive utility, as the test only reflects the validity of the instrument at the point in time of testing.

Predictive validity. While similar to concurrent validity, predictive validity provides a comparison between the instrument being tested and an outcome assessed at a later time. It therefore assesses the extent to which scores on an instrument predict performance on a future variable (Schultz & Whitney, 2005).

Convergent validity and discriminant validity. Although convergent and discriminant validity are separate subtypes of criterion validity, they are closely related concepts, assessing validity at opposite ends of a spectrum. Convergent validity assesses the extent of the relationship between two instruments measuring theoretically related constructs. An example of this would be comparing the relationship between the AAQ-II (Bond et al., 2011) with the MEAQ (Gámez, Chmielewski, Kotov, Ruggero, & Watson, 2011), both measures of experiential avoidance, where convergent validity could be established if the AAQ-II and MEAQ measured experiential avoidance in a way that corresponds or converges. In contrast, discriminant validity is the capability of an instrument to differentiate or discriminate between constructs which are theoretically different. Testing is therefore to ascertain whether constructs that theoretically are not expected to be related to one another are observed to be unrelated. It is important to acknowledge that convergent and discriminant validity work together and are not sufficient to establish construct validity if used alone.

Reliability. While validity refers to the extent to which an instrument is measuring what it claims or intends to measure, reliability is concerned with how consistent an instrument is. This is not an exact science, but it is possible to calculate an estimate of reliability through different methods. There are two types of reliability, internal and external reliability. Internal reliability measures

the consistency and extent to which all items in an instrument measure one construct. External reliability considers the consistency of results when procedures are repeated (giving an indication of the instrument's ability to provide replicable results).

Internal reliability, also referred to as homogeneity can be tested in a number of ways; Cronbach's alpha, split-half reliability, item to total correlation, and the Kuder-Richardson test (Heale & Twycross, 2015). Cronbach's alpha is the most commonly used test of internal consistency, and therefore most frequently reported in the literature. Cronbach's alpha is a number between zero and one, with acceptability in terms of reliability being determined as a score of 0.7 or higher (Tavakol & Dennick, 2011).

External reliability can be broken down into stability and equivalence. The stability of an instrument is most often calculated using test-retest which provides the correlation between two successive measurements using the same test. This is facilitated, for example, by asking a group to complete an instrument at two time points, with the idea that if the instrument is stable, the two sets of data should highly correlate, indicating reliability.

Equivalence is calculated using inter-rater reliability testing, which assesses the degree different raters give consistent estimates of the same behaviour. This process therefore involves determining qualitatively, the level of agreement between two or more raters or judges. This aims to assess whether all raters or judges apply the data collection method consistently. Consistent scores indicate higher level of inter-rater reliability of the instrument.

Cognitive Interviewing

Cognitive interviewing (CI) was outlined briefly in the journal paper. In the following section, this will be expanded upon to provide further information about the objectives of CI, the role of cognitive theory, the techniques used within CI ("think aloud" and verbal probing), and the different ways CI can be applied.

Introduction and objectives of CI. Cognitive interviewing (CI) originated in the fields of psychology and survey methodology. The field of survey methodology largely comprises quantitative elements, however CI is a form of qualitative inquiry, therefore contributing a different angle to analysis of survey instruments. CI is used to test (or pre-test) surveys and measures in terms of understanding the response processes and identifying problems with items. Broadly speaking, according to Willis (2015), the objectives of CI fall into two categories: (1) Reparative CI and (2) descriptive CI.

The reparative approach is most often the focus of survey pretesting where the aim is to inspect surveys, make improvements, and reduce response error (Miller, 2011). This involves a process of "finding and fixing", for examples of this, see DeWalt, Rothrock, Yount, & Stone, 2007; Morgan, Amtmann, Abrahamson, Kajlich, & Hafner, 2014; Yorkston et al., 2008. The descriptive approach on the other hand is concerned with interpretation of items or questions on a survey. This may lead to modifications to items should interpretations be problematic or inconsistent with intended interpretations. However, descriptive CI may also serve to better understand the function or internal workings of items. Therefore the focus is not on improvement or repair, but on understanding how surveys function as measures of particular concepts or processes (Ridolfo & Schoua-Glusberg, 2011). It is important to note that reparative and descriptive forms of CI are not dichotomous, studies can incorporate both elements but there is, conceptually a distinction between the two. Furthermore, the reparative approach is typically used in the development of a survey or measure where modifications and alterations are made between iterative rounds of CI testing. Descriptive CI on the other hand can be applied separately to the development process, where the focus is on investigating how survey items function and concepts are understood (Willis, 2015). The objective of the current study was primarily on descriptive CI, where the focus was on how respondents understood and interpreted both the CompACT and the AAQ-II. While there was also a focus on identifying problems with items (linked to comprehension and interpretation), the study did not serve to repair any issues and was therefore not classed as reparative.

CI and cognitive theory. As outlined in the journal paper, CI is underpinned by cognitive theory. It was born out of the Cognitive Aspects of Survey Methodology (CASM) movement (Jabine, Straf, Tanur, & Tourangeau, 1984; Hippler, Schwarz, & Sudman, 1987) which made significant progress in understanding the cognitive and communicative processes that underlie survey responding, building on the premise that errors in responses to surveys arise from difficulties in the cognitive processes used to produce a response. The theoretical basis of the CASM has its roots in cognitive psychology from which knowledge is drawn that explains how respondents go about answering survey questions. A commonly cited model derived from CASM is Tourangeau's four-stage cognitive model (Tourangeau, 1984) which is discussed briefly in the journal paper. More detailed information is presented in Figure 2 adapted from Willis (2005). The model outlines that there are four processes that take place when answering a question on a survey instrument: (1) a person must first be able to comprehend the question, (2) then be able to retrieve the necessary information from long-term memory, (3) they must subsequently be able to make a judgement about how to answer the question based on the information they have retrieved, and (3) then provide a response. Comprehension is vital as whether the respondent understands the question as intended by the author is integral to the rest of the cognitive processes and also has significant implications for the conclusions to be drawn from the response itself. If understanding varies from what was originally intended, ultimately, the response given may be flawed. Therefore the objective of the researcher is to design questions that are comprehended by all respondents in the way they intended the questions to be understood. Understanding how easily respondents then go on to retrieve the information needed to respond is important as this may provide clues regarding potential question errors. The types of judgements used during the question-answer process can reveal important information regarding how respondents use the information retrieved from memory to formulate answers. This leads finally to the response itself which consists of the respondent needing to format and edit their response prior to communicating it. Researchers have consequently used cognitive processing

theories to develop cognitive methods of survey instrument testing, the most commonly used of which is cognitive interviewing.

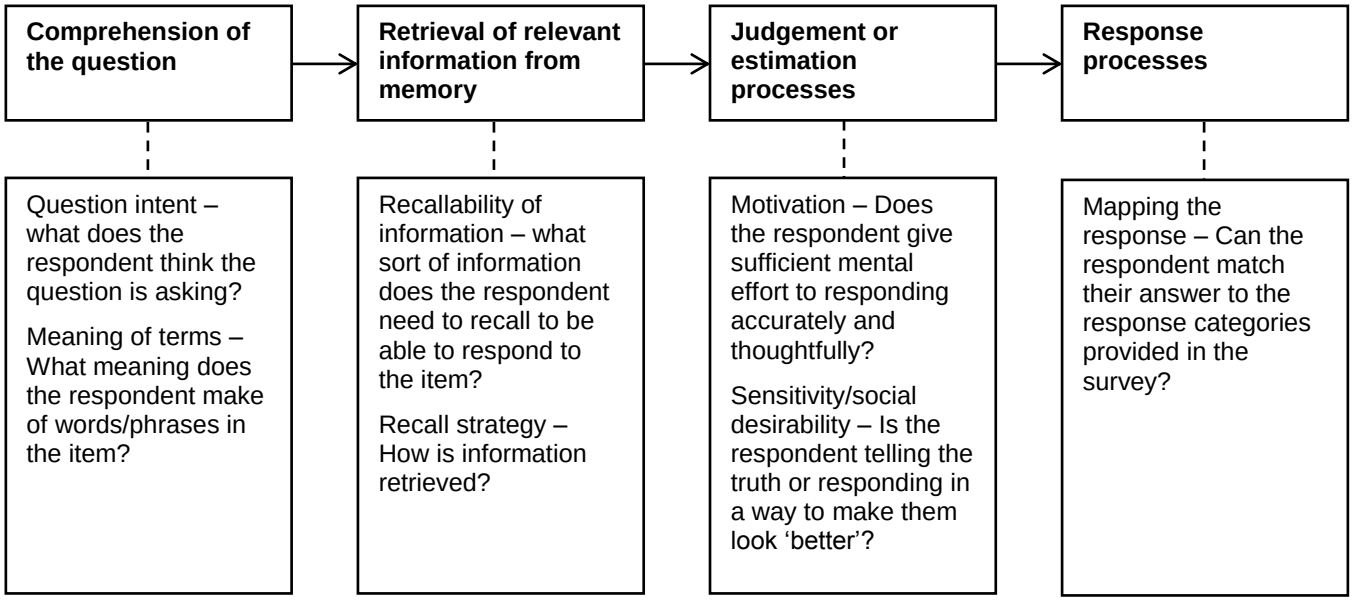


Figure 2. Tourangeau's (1984) four-stage cognitive model of the survey-answer process

Techniques used within CI. In the following section, the two methods commonly used in CI, (1) "think aloud" and (2) verbal probing will be outlined in greater detail to complement information provided in the journal paper. The 'think aloud' method originated from a movement to consider verbal information as data (Ericsson & Simon, 1980). In the context of measure development it is a process of asking respondents to verbalise thought processes at the time of item completion, allowing for information to be collected, otherwise not usually gathered by conventional quantitative methods, about the cognitive processes occurring. 'Think aloud' involves the interviewer using open questions to elicit active thought processes, resulting in minimal input from the interviewer. As highlighted in a recent systematic review looking at the CI methodological processes used in the development of patient reported outcome measures, drawbacks of using the 'think-aloud' technique alone are the potential (parallel-processing) burden placed on the respondent which may impact on the ability to accurately assess cognitive processes and the potential to introduce information processing biases by encouraging respondents to invest more conscious effort

into answering a question than they normally would (Wright, Moghaddam, & Dawson, 2019). Verbal probes differ slightly in their focus as they are used after a response has been provided (rather than during the question-answer process as with the 'think-aloud' technique) and they serve to provide additional information about the basis of the response provided. Examples of verbal probes include: 'how did you arrive at that answer?', 'Did you find that easy or hard to answer?', or 'I noticed you hesitated initially, what were you thinking about?' Verbal probing allows the interviewer to control the focus of the interview, particularly when this relates to potential sources of response error. However, bias may be increased with this approach due to the potential that participant responses are influenced by the interviewer's own assumptions and objectives (Wright et al., 2019). These techniques are designed to complement one another (Collins, 2003) rather than for use in isolation. It seems most beneficial therefore to use a combination approach of 'think-aloud' and verbal probing techniques to best investigate self-report measures and their fulfilment of their intended purpose.

Application of CI. CI can be applied either concurrently (while the respondent completes the measure) or retrospectively (following completion of the measure). The benefit of concurrent interviewing is it allows for 'think-aloud' to be used therefore eliciting information about immediate recall and cognitive processes in real time. This is something less likely in retrospective CI where respondents are asked not only to talk through their process of answering a question, but also consider what they were thinking about at the time of completion, thereby challenging memory and recall and potentially missing important data (Schwarz, 2007). Therefore concurrent CI may be a more useful application when considering cognitive processes, however, it is argued that it can make the process of measure completion artificial due to the fragmented nature of the approach as measures are not completed in the context in which they have been designed (Wright et al., 2019). Furthermore, there is also evidence that concurrent interviewing may introduce interruptions in the question-answer process which some groups of respondents may find problematic, for example, those of a lower educational level (DeMaio & Bates, 2007). Willis (2015) recommends using retrospective CI for analysis of self-

completion measures to avoid interference with the question-answer process, and allowing for the genuine, intended form of the measure to be upheld. Addressing the potential issue with recall, he states that probing can be used to help remind a respondent – although he questions the utility of this when an individual has already stated they do not remember. This also highlights the potential issue that respondents may (with a view to be helpful) fabricate responses, but this will be undetectable through analysis, therefore probing to remind when recall seems an issue must be used with caution.

In the aforementioned systematic review of CI methodological processes, nearly one third of the included studies used retrospective CI. Most of the studies however, used concurrent CI (Wright et al., 2019). With little consensus in approach in the literature, and the benefits and drawbacks of each approach seemingly cancelling one another out, this posed a dilemma when planning the CI approach for the current study. This therefore presented an opportunity to test this methodological dilemma by using both retrospective and concurrent CI methods.

Aims

In addition to the three aims outlined in the journal paper, the study had a fourth aim: to compare any differences in responses between the concurrent and retrospective CI groups.

Method

In the following section, additional information regarding methodological aspects of the study will be presented. This will include a section on ontology and epistemological position, further information about the selection and recruitment of participants, the inclusion and exclusion criteria, details of participation incentive, and further details regarding CI procedure. The rationale for analysis procedure, and more details about the analysis stages are also presented. In the final section, methodological details with respect to the additional fourth aim of the study are also presented.

Ontological and Epistemological Position

Ontological and epistemological positions are argued to be central to the choices made by researchers about methodology in their investigation of the social world. How this relates to the current study will be outlined below.

Ontology. Ontology is the study of being and what constitutes reality. It is concerned with whether social reality exists independently of human understanding and interpretation. Snape and Spencer (2003) make a distinction between three ontological positions; realism, idealism, and materialism. Realism assumes an external reality which exists independently from human thought our understanding. Like realism, materialism assumes the existence of a real world but this is only evident and shaped through the tangible, physical world. Conversely, idealism asserts that knowledge of reality can only be gained through human understanding and socially constructed meanings. The current study focused on how respondents understand, interpret, and respond to two ACT process measures, a model which is grounded in objective reality with its basis in behaviourism (where reality is rooted in the physical world and understood empirically through observation and experience). Furthermore, understanding and exploring the question-answer process involves the use of a cognitive processing model (Tourangeau, 1984) which grounds the process of formulating a response cognitively in objective reality. In terms of ontological position, this study was based on the notion of realism.

Epistemological position. Epistemology is interested in the nature and forms of knowledge where assumptions are concerned with how knowledge is created, acquired, and communicated and what this means about social reality. Broadly, epistemology can be split into two main perspectives of knowledge; positivism and interpretivism. Positivism asserts that knowledge of the world is external and there is a single objective reality to be observed (Hudson & Ozanne, 1988). Research in this context is therefore conducted to seek objectivity and using structured techniques, often statistical or mathematical in nature to research fact and obtain empirical evidence. Interpretivism on the other hand is the belief that there is not a single reality of which to gain knowledge of, but knowledge of reality is varied and relative. Multiple realities

depend on meaning and interpretation. Knowledge is therefore viewed in interpretivism as socially constructed through language, rather than objectively determined. Research from an interpretivist position focuses on capturing meaning, often through qualitative means. It does not seek to generalise or predict cause and effect relationships.

The polarisation of these approaches can be problematic in research, particularly in the context of studies using both quantitative and qualitative approaches where the ontological and epistemic positons are different. It also poses problems for research where ontologically a phenomenon is grounded in realism, but researchers seek to explore how knowledge of that phenomenon is understood and communicated, as is the case with the current study. Critical realism provides an approach which bridges the gap between positivism and interpretivism. It asserts that social objects exist and are grounded in reality but that knowledge of these objects is critical in nature because it is dependent on how knowledge is created and constructed by individuals (Scott, 2007).

Ontologically, the current study is grounded in realism, but it is concerned with how respondents understand and interpret ACT process measures and in turn, how these interpretations link to the theoretical underpinnings of ACT. Understanding and interpretation is therefore communicated through socially constructed language which will be gained using qualitative methods. This study will therefore be carried out according to a critical realist framework where language is understood to be used to construct our social realities but these constructions are limited to that which is grounded in the objective world (Archer, Bhaskar, Collier, Lawson, & Norrie, 2013). Furthermore, the study also included the use of quantitative methods (collecting participant scores on the AAQ-II and CompACT and conducting t-tests to compare differences between the retrospective and concurrent interview conditions), therefore a critical realist approach was fitting.

As the CI methodology will follow a qualitative approach with roots in cognitive psychology and survey methodology, data collection will be influenced by the researcher's own context and interpretation. Analysis took a structured

approach whilst still relying on personal interpretation of the data and hence navigating this interaction between constructionist and positivist approaches was essential (Willis, 2015).

Additional information about Selection and Recruitment of Participants

Participants were selected and recruited from the general public. An advertisement for the study was posted on University of Nottingham social media accounts and in publicly viewed areas of publicly accessed buildings across various locations in the East Midlands area. Participants were also asked to draw on their existing social networks as required (snowball sampling). The researchers also drew on their own social networks to identify potential participants from any demographic groups that were under-represented from other recruitment methods. Potential participants were asked to contact the researcher if they were interested in taking part. At this time, basic demographic information regarding, age, gender, ethnicity, and educational/vocational status was collected and a basic screening for prior ACT knowledge carried out.

Participants were recruited if they met the inclusion criteria for the study. Demographic information of participants was continuously monitored and certain groups targeted to ensure representation.

Inclusion and Exclusion Criteria

Inclusion

- No prior experience of ACT
- ≥ 18 years of age
- Capacity to give informed consent to take part in the study
- They are able to communicate fluently in English

Exclusion

- Diagnosis of a neurocognitive disorder which may interfere with cognitive processing

Participant incentive

Participants were offered the opportunity to be entered into a prize draw following completion of the study with 1 x £50, 1 x £20 and 1 x £10 Amazon vouchers available as prizes.

Randomisation

To explore best practice in terms of CI methodology, it was decided that half of the participants would take part in a CI retrospectively (following completion of the CompACT and AAQ-II), and the other half concurrently (while they completed the CompACT and AAQ-II)

Participants were randomly allocated to one of two groups – concurrent or retrospective CI (1:1 ratio) – based on a computer-generated random number sequence, using block randomisation with randomly permuted block sizes of 2, 4, and 6. The allocation sequence was generated and held by one researcher (NM, co-author) and concealed from the other researchers. Randomisation took place to assess whether there were any discernible differences between these CI designs to draw conclusions about best practice.

Rationale for and Process of Analysis Approach

In his book, Willis (2015) outlines analysis strategies for cognitive interview data, presenting five models which he outlines as applicable within certain contexts. These models are; (1) text summary, (2) cognitive coding, (3) question feature coding, (4) theme coding, and (5) pattern coding. He also usefully outlines a flowchart to help guide decisions regarding analysis procedures which is presented in Figure 3 for clarity. This flowchart was based on analysis used within his own research and also on those used in other CI publications. This flowchart demonstrates subtleties in how CI data can be analysed and interpreted. Willis (2015) caveats the figure by emphasising its use as a guide rather than a prescriptive process, as is often the case in qualitative analysis where processes can be adapted to fit the data and research questions. Willis (2015) notes; “Motivated practitioners can (and should) produce variants or

hybrids that borrow elements from each of these five basic skeletal representations" page 60.

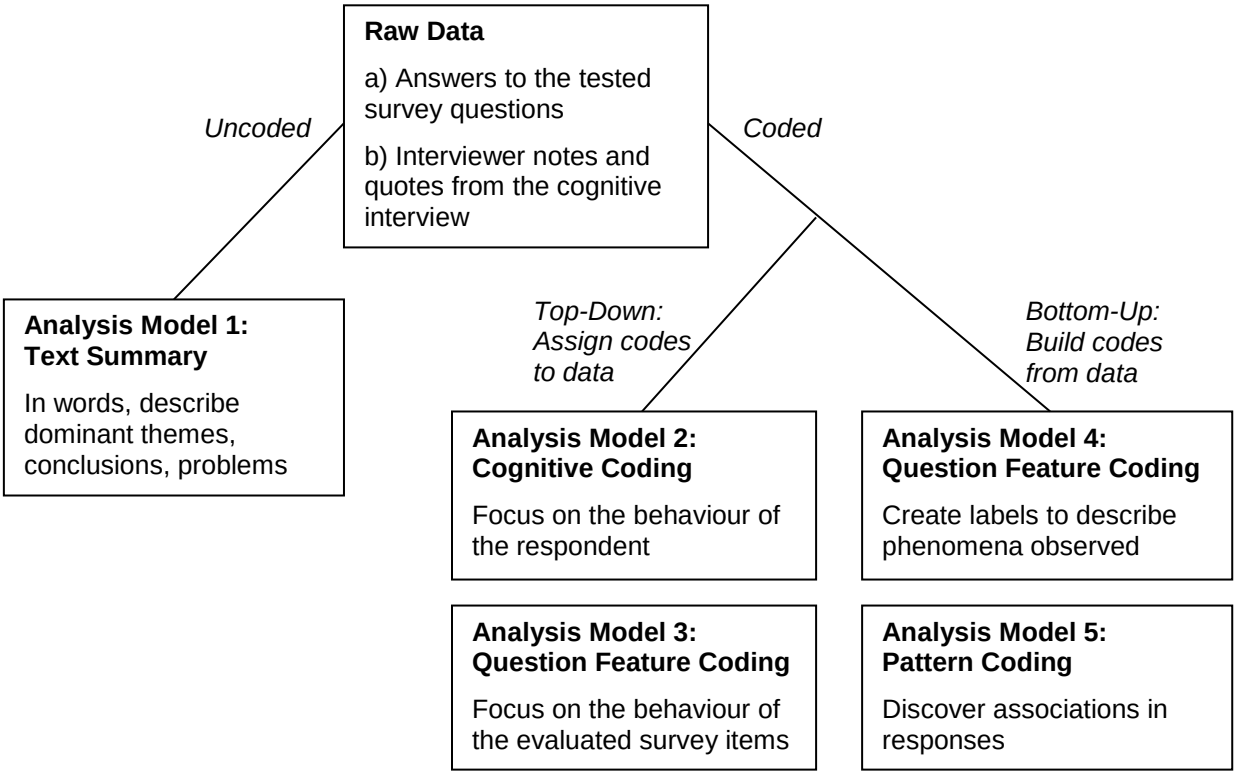


Figure 3. Willis's (2015) flowchart of five models of analysis for CIs.

Deciding on the approach to analysis involved close consideration of the aims of the study and taking or using different analysis models depending on the aim and then amalgamating this into an overarching approach to analysis. This is best described in a linear way for clarity. Firstly, how the data was analysed at the respondent or item level will be described, and then the approach to bring this together will be presented. To do this, the decisions made and approach taken to address the first and third aims of the study (documented in the aims section of the journal paper) will first be presented followed by how the second aim was approached.

The first aim of the study was to explore how respondents understand, interpret, and respond to items of the CompACT and the AAQ-II. Given that this was therefore focused on how respondents interacted with the items and the sense they made of them, an approach based on analysis model 2 was used which

focused on the behaviour of the respondents themselves. This involved coding particular words or phrases used by respondents which was largely a more formal version of the text summary approach (analysis model 1) as dominant themes or problems were noted. This followed an approach of using the cognitive model to consider understanding and decision making processes but also a consideration more closely of the content of participant responses with a view that this would be relevant to considering how responses mapped onto ACT processes later in the analysis process.

The third aim was to highlight any idiosyncratic responses or issues indicative of problems with items on the CompACT and the AAQ-II. With this in mind, the data was approached from the perspective of analysis model 3 - question feature coding, as it was important here to understand how participant responses related to the behaviour of the evaluated items themselves, thereby providing an understanding of any problems or issues with items. As described in the journal paper, idiosyncratic responses or issues with items were categorised deductively and inductively using an existing coding scheme used by Knafl et al. (2007) and based on issues identified in the data. This differed from Willis's (2015) suggestion that coding of question features involve using a priori coding as a combination, inductive-deductive approach was used in the current study. Using this approach to considering the behaviour of the AAQ-II and CompACT items involved a subtle shift in perspective. Rather than considering what cognitive difficulties were involved in respondents having problems with items, the problematic aspects of the items were considered instead. This form of analysis was first applied by Willis (2015) in the process of addressing how item features themselves might result in difficulty, rather than respondent cognitive behaviour.

Lastly, the approach taken to synthesising and drawing together the analysis will be discussed. The second aim was to explore how responses on the CompACT and the AAQ-II correspond with the intended ACT processes being measured and how these related to the literature of psychological flexibility. To address this aim it was decided that an approach akin to that described by Willis (2015) as pattern coding (analysis model 5) where the focus was on identifying

patterns and associations in responses would be best. Willis (2015) describes this approach as being similar in resemblance to Framework Analysis (Spencer, Ritchie, & O'Connor, 2003) due to its focus on discovering patterns in the data. In the current study we were concerned with how responses to items corresponded with ACT processes as intended and therefore it was important to look for the level of correspondence across responses to items. To do this, data was arranged in an excel spreadsheet so that patterns could be considered visually across items for each participant. This then allowed for analytical syntheses (discussed further in the next section and within the journal paper) to be developed as a representation of the patterns found in the data and incorporating findings about the respondent and item behaviours.

Analytical syntheses

In this section, further information is provided with regard to analysis of the CI data, namely that prior to the development of analytical syntheses of responses to the subscales on the CompACT and the AAQ-II, analytical syntheses were developed for each item on each measure. This was not reported in the journal paper due to limits in word count. The analytical procedure is therefore reported in this section, and the data presented in the results section.

For each item, a synthesis of participant responses (forming an integrative summary of interpretations of that item) was developed. To do this, for each item, each participant's response was reviewed and coded to ascertain their understanding and interpretation of the item. This was then consolidated into a synthesis drawing together descriptive themes of participant interpretations or understanding from the measures, and what they drew on to respond. The format of the synthesis was intended to summarise overall responses to the item, while effectively conveying convergent and/or divergent viewpoints. Syntheses also included a comment when responses were idiosyncratic (i.e., responses which diverged from the majority in theme).

Reflexivity

The concept of reflexivity is considered to be a core process involved in qualitative research (Berger, 2015; Horsburgh, 2003). In this process, the

researcher considers their positionality through continual dialogue and critical self-evaluation making it explicit that the position held impacts on the research process and the outcome (Bradbury-Jones, 2007). This process is similar to the concept of counter-transference in psychodynamic psychotherapy, where emphasis is placed on self-appraisal and an understanding of self-context on research. This fits with the critical realist framework as the process of gaining knowledge does not occur independently from the researcher, rather the researcher has a role in knowledge production.

When considering reflexivity, it is important to consider a number of factors including; gender, race, age, political and ideological stances, language, experiences of interaction with participants, relationship to the research, personal experiences and beliefs, and many more. Berger (2015) put forward the view that these factors contribute to the research process and it is important that researchers openly reflect on how their position may impact their research. With respect to reflexivity in qualitative research, Horsburgh (2003) stated:

> Given that the researcher is intimately involved in both the process and product of the research enterprise, it is necessary for the reader to evaluate the extent to which an author identifies and explicates their involvement and its potential or actual effect upon the findings. p.309

In the current study, I conducted interviews and analysed the data. My position as a Trainee Clinical Psychologist conducting the research as part fulfilment of receiving a Doctorate in Clinical Psychology impacted my involvement in the research, where my personal goal was to undertake high quality research, therefore resulting in careful attention to conducting and analysing interviews. My personal investment in the study therefore may have impacted on how the findings were generated. I am also aware of my own knowledge of ACT and how when analysing interview data this knowledge may have impacted on the interpretations, codes, and analytical syntheses made. The role of the research supervisors in providing quality checking of data helped with this process to ensure that I did not make interpretative leaps. However, with an extensive

professional background of research in ACT themselves, this too will have influenced their interpretations of the data.

It is important to note also that the research supervisors of this study were the authors of the CompACT, therefore they had a professional interest in the outcome of the study. This may have resulted in implicit bias, where they may have viewed the CompACT more positively on the basis of their relationship with the measure. It was important that I positioned myself separately from this process, ensuring my analysis or critique was not influenced. Potentially, this may have resulted in me adopting a more critical stance with respect to the CompACT in an attempt to ensure that I was not biased towards the success of one measure over the other.

Analysis of Differences Between Retrospective and Concurrent Groups

To examine differences between the retrospective and concurrent groups with respect to whether these conditions impacted on participant scores on each measure, independent t-tests were conducted.

Results

In the next section, the data relating to the additional fourth aim is presented in the form of t-tests conducted to assess differences between the two groups on each measure. After this, extended CI results will be presented, presenting findings at the item level.

Concurrent versus Retrospective CI

The retrospective group (*N*=13) was associated with a CompACT score of *M*=102.08 (*SD*=12.40). By comparison, the concurrent group (*N*=13) was associated with a numerically smaller CompACT score of *M*=95.31 (*SD*=12.70). To test the hypothesis that the retrospective group and the concurrent group were associated with statistically significantly different mean CompACT scores, an independent samples *t*-test was performed. As displayed in Table 1, while the retrospective kurtosis score of -.13 was sufficiently normal as it was

between -2 and 2 (George & Mallery, 2016), the rest of the retrospective and concurrent distributions were not classed as sufficiently normal as skew and kurtosis was outside the parameters deemed indicative of normality (George and Mallery, 2016). Despite this, an independent samples *t*-test was still performed as this test is robust to the assumption of normality as it makes inferences that means of data and means of samples from any distribution will be normal (Altman & Bland, 1995). In addition, the assumption of homogeneity of variances was tested and satisfied using Levene's test for equality of variances, $F(24) = .12$, $p = .735$ meaning that the test could be confidently interpreted. The independent *t*-test was not associated with a statistically significant effect, $t(24) = 1.38$, $p = .182$. Thus, there was no significant difference in mean scores on the CompACT between the retrospective and concurrent CI condition. Although the finding was not significant, as the sample size in the study was small and therefore the chances of detecting a statistically significant difference between the groups was less likely, an effect size calculation was carried out. This was deemed appropriate as effect sizes are unaffected by sample size, and therefore provide a truer measure of the size of the effect between variables (Ferguson, 2009) Cohen's *d* was estimated at 0.54, indicative of a medium effect size (Cohen, 1992).

	N	Mean	SD	Skew	Kurtosis
Retrospective	13	102.08	12.40	-.35	-.13
Concurrent	13	95.31	12.70	.54	-.99

Table 1. Descriptive statistics of the AAQ-II scores for the retrospective and concurrent groups.

The retrospective group (*N*=13) was associated with an AAQ-II score of *M*=12.92 (*SD*=4.44). The concurrent group (*N*=13) was associated with a numerically larger AAQ-II score of *M*=16.38 (*SD*=6.01). To test the hypothesis that the retrospective and concurrent groups were associated with statistically significantly different mean AAQ-II scores, an independent samples *t*-test was performed. As can be viewed in Table 2, the retrospective and concurrent distributions were not classed as sufficiently normal as skew and kurtosis were

outside the parameters deemed indicative of normality (greater than -2 and 2; George and Mallery, 2016). Despite this, an independent samples *t*-test was still performed for the same reasons as were outlined in the previous paragraph. The assumption of homogeneity of variances was tested and satisfied using Levene's test for equality of variances, $F(24) = .79$, $p = .382$ meaning that the test could be confidently interpreted. As with the CompACT mean scores, there was no significant difference in mean AAQ-II scores between the retrospective and the concurrent group, $t(24) = -1.67$, $p = .108$. Again, the effect size was calculated to give an indication of the size of any difference between the mean scores for each group. -0.66, demonstrating a medium effect size (Cohen, 1992).

	N	Mean	SD	Skew	Kurtosis
Retrospective	13	12.92	4.44	.66	-.53
Concurrent	13	16.38	6.01	.21	-.45

Table 2. Descriptive statistics of the AAQ-II scores for the retrospective and concurrent groups.

Additional CI Results

In the following section, the CI results will be presented in more detail with a focus on the findings per item for each measure. For ease, this is presented in two tables. The first (Table 3) is the findings relating to the CompACT and the second (Table 4), the findings for the AAQ-II.

Table 3. Presentation of analysis of each item of the CompACT.

CompACT Items	Target ACT Process	Analytical Summary	Primary/Secondary (if applicable) ACT Process(es)	Response Range	Example Quotations and Item Score Provided (Participant Number and Demographic Characteristics)
1. I can identify the things that matter to me in life and pursue them	Valued Action	All participants were able to easily identify things that matter to them and consider how they pursue these. One response was inconsistent with the item rating given (P16)..	Primary process: Values Secondary process: Committed action	3-6	*'Given that I'm now retired, I've given an awful lot of thought to the things that matter and I'm going for it. I've thought about what the next 10-20 years will bring and make it worthwhile. I know what I want to do and achieve.'* Score = 6 *(*P11, aged 60, male, white, retired). *'I think I know how I'd like my life to go. I know what matters to me. Family, work. For example, when this job came up I knew I wanted to go for it and it fitted in with what I wanted in terms of my plans.'* Score = 5 (P4, aged 50, female, white, employed) *'I think I can. I think I do. It's about objectives. I'm a project man'* Score = 3 (neither agree nor disagree) (P16, aged 86, male, white, retired)

2. One of my big goals is to be free from painful emotions	Openness to Experience (Acceptance)	The majority of respondents noted that painful emotions were part of life and the importance of experiencing a range of emotions. Statements were made about a desire to not experience painful emotions, but that they did not have a specific goal to be free from them. Some participants identified a wish to be free from painful emotions and therefore agreed with the statement.	Primary process: Acceptance	0-6	*'I've had painful emotions in the past but I'm free of those now and I've moved on from that. I can't see why people wouldn't want to be free from that. I would strongly agree.'* Score = 6 (P5, aged 50, female, white, employed) *'I don't think being free from painful emotions is necessarily a good thing because then you don't experience anything. Painful emotions are important. But you don't want painful emotions to be all there is. So while I think they're important, you don't want to be either completely shut off from them or completely overwhelmed by them. So I answered in the middle.'* Score = 3 *'I see emotions as something that are important. You can't escape them, it's important to feel them. I don't try and run away from painful emotions, it's trying to deal with them.'* Score = 0 (P9, aged 28, male, white, employed)
3. I rush through meaningful activities without	Behavioural Awareness	There was a focus on the word meaningful. Participants considered	Primary process: Committed action Secondary process:	0-4	*'For me, those two things [meaningful activities and being really attentive to them] would have to go hand in hand and I probably wouldn't start to*

being really attentive to them		how you identify what is meaningful or not. There was agreement that being attentive to something meaningful is desirable. There was also appreciation that this can be difficult and things get in the way such as other demands/not being in the moment/routine tasks which can be easily completed.	Behavioural awareness		*pursue an activity that was meaningful to me if I wasn't able to be attentive to it.'* Score = 1 (P1, aged 32, female, white, employed) *'That made me think of sometimes when I go places, like on holiday, that's really meaningful, I love travelling. But sometimes in the moment I don't feel like I take everything in. Then afterwards I think 'I wish I was more in the moment there'. I wish I'd taken in what was around me.'* Score = 3 (P23, aged 28, female, white, employed) *'Some meaningful activities don't require a lot of attention just because they're meaningful. Some are routine but they're meaningful so I probably rush through some but I know what I'm doing but others I would have to pay more attention to them because I know they're important.'* Score = 4 (P13, aged 64, male, white employed)
4. I try to stay busy to keep thoughts and feelings from	Openness to Experience (Acceptance)	Responses demonstrated an understanding of why keeping busy could help keep thoughts and	Primary process: Acceptance	1-6	*'I put moderately disagree to that. I'm a relatively busy person but I don't do that to stop thoughts or feelings from coming. I'm quite an open book. I'm like that at work and in my personal life. I like*

coming		feelings from coming. Participants quickly identified whether this was something that was true of them or not. A few participants who identified themselves as busy people spent time considering the function of busyness and whether this played a role in keeping thoughts and feelings from coming.			*doing things and keeping my mind occupied rather than to prevent things. I questioned if that's why I'm busy but it's not for that reason.'* Score = 1 (P8, aged 30, female, white, employed) *'I don't try to stay busy to stop myself from thinking about things or feelings from coming. Although I guess sometimes if there's something major happening emotionally and it's unusual I would try and do that. But it wouldn't be a normal way of coping.'* Score = 3 (P13, aged 64, male, white, employed) *'With that one the main phrase is to keep feelings from coming. From past experiences, if someone experienced similar to me, I find that particularly difficult not to just cry as well. I do do that. Pushing those emotions down and being in that defence mode.'* Score = 6 (P19, aged 23, female, white, employed)
5. I act in ways that are consistent with how I wish to	Valued Action	Most participants answered this on the basis of how they hope	Primary process: Committed action	2-6	*'I slightly disagree on that because I'm bound to be influenced by what others want. In life, you've got to take others' wishes into account. I try to do*

live my life	they act (social desirability). Some participants could identify whether their behaviour and values were consistent but this usually depended on reflection of earlier experiences where they felt this had been inconsistent. Some participants talked about how judgement of this is difficult when values compete.	*what I want to do but I'm prepared to be flexible if it's counter to other people's ambitions or happiness.'* Score = 2 (P16, aged 86, male, white, retired) *'Actually making sure you're consistent with values can be easy to say but can you actually achieve that? Because there's the word act. Do I actually act? It depends on how many external things you have that affect you, for example, there were times when working full-time I'd have to leave home and give up weekends which I didn't want to do but I had to do it because it was my job and that went with the territory. Is that acting in ways that are consistent with how I wish to live my life?'* Score = 4 (P12, aged 62, female, white, retired) *'That is something I strongly subscribe to that how I want to live my life and be treated by others and how I see myself is reflected in how I am. I believe that the way you act is the way that you lead the life that you are after.'* Score = 6

					(P6, aged 40, male, white, employed)
6. I get so caught up in my thoughts that I am unable to do the things I most want to do	Openness to Experience (Defusion)	Most participants made the link between their thoughts and their behaviour, either stating they were able to do the things they want to do and not getting caught up in thoughts, or that they might be likely to get caught up in thoughts which in turn impacts their behaviour. Some participants related the concept of "being caught up" in terms of cycles of thoughts.	Primary process: Defusion Secondary process: Committed action	0-4	*'I don't get caught up in thoughts. You have days or moments where things do come into play but I don't think generally speaking whether thoughts and feelings make me unable to do things during the day it would be no.'* Score = 0 (P26, aged 30, female, white, employed) *'I felt like maybe sometimes but then other times definitely not. It's probably just overthinking something and therefore not doing anything. I didn't feel that either agree or disagree would be reflective of me.'* Score = 3 (P2, aged 36, male, white, employed) *'Are there things that cause you to be almost paralysed? Yes if I look at the last year and the impact of bereavement and the things I wanted to do, I allowed the thoughts to paralyse me from doing the things I want to do.'* Score = 4 (P12, aged 62, female, white retired)
7. I make choices	Valued Action	Participants focused on	Primary process:	2-6	*'I'm bad at doing that. I would slightly disagree*

based on what is important to me, even when it is stressful		'what is important to me' primarily when responding, with most participants commenting that if it's important to them, they will do it even if things are stressful. A few participants described how stress can negatively impact on their choices, particularly when decisions involved a perception that others may be upset. One participant conceptualised the process of doing something important to you even if it is stressful as resilience.	Committed action		*with that one. I'm not very good at that. I like to please people so even if I know I'm making the right decision, if it's starting to cause me stress I'll back out of it.'* Score = 2 (P5, aged 50, female, white, employed) *'It depends on the situation. If I think it's important enough I might carry on, even if it's stressful. Other times I might not bother, I might just leave it. A lot of things are important to me but it's working out if I want to do it if it causes a lot of stress and the end result might be worse.'* Score = 3 (P21, aged 65, male, Asian, retired) *'My job means I have to do things I don't like doing or don't feel comfortable doing but that's how I like to learn. I have to push myself to do things I don't enjoy doing because my goal is to be the best I possibly can be.'* Score = 6 (P25, aged 35, male, white, employed)
8. I tell myself that I shouldn't have certain	Openness to Experience (Acceptance)	All participants felt that 'telling myself that I shouldn't have certain	Primary process: Acceptance	0-6	*'I do have things I think that I might think 'oh no don't think that' but as long as I don't say that it's ok. It's usually rude or offensive thoughts about*

thoughts		thoughts' related to 'negative' thoughts. Participants discussed the extent to which this was reflective of their attitude with many participants stating that negative thoughts were not desirable. A small number of participants talked about thoughts in terms of social judgements or social acceptability.			*others rather than thoughts I'm having about myself that I think I shouldn't have. It's more about what's socially appropriate'* Score = 1 (P3, aged 28, male, white, employed) *'I don't think on the bad side all the time but you can't stop thoughts. I neither agree nor disagree.'* Score = 3 (P15, aged 79, female, white, retired) *'I think we all do that don't we? Depends on what thoughts they are. Certain thoughts could be anything - suicidal thoughts in the past, naughty thoughts. I would say if it's something negative I would probably tell myself I shouldn't have those thoughts and think about why I'm having those thoughts and do something about it.'* Score = 5 (P5, aged 40, female, white, employed)
9. I find it difficult to stay focused on what's happening in the present	Behavioural Awareness	Most participants understood the concept of being in the present and responses related to a general sense of behavioural awareness.	Primary process: Mindfulness	0-5	*'I think I'm pretty in the moment and appreciate what's going on right here right now. I don't think that's in anyway like me.'* Score = 0 (P26, aged 30, female, white, employed)

		Two respondents related the question more closely with focus on tasks rather than present moment awareness.			*'I think I'm quite focused on the end game, the long goal. That means I don't necessarily think in the present all of the time. So I probably don't do some of the things I want to do day to day as a result.'* Score = 2 (P9, aged 28, male, white, employed) *'It's not enough a problem that it happens all the time but it is something I'm aware of. If I'm out for dinner, I'm thinking about the next course. I feel like I can still enjoy what's happening, I'm not that preoccupied but I am more focused on the future than I am on the present.'* Score = 5 (P24, aged 27, female, white, employed)
10. I behave in line with my personal values	Valued Action	The majority of respondents expressed a sense of hoping or knowing that they behaved in line with their personal values. There was a sense of values being difficult to identify for some but most agreed they related to core	Primary process: Values Secondary process: Committed action	1-6	*'Probably not as much as I think. I get stressed easy, I probably lose my temper more than I should and my personal values I'd like to say if I had children and stuff like that, it's not what I'd like to teach them. So, I don't overly follow what I preach sometimes.'* Score = 1 (P18, aged 23, male, white, employed) *'Well I hope I do. One hopes they are living life*

		values based on morals/ethics established during upbringing. One participant answered lower down on the scale and their response reflected a sense that values were not always reflected in their behaviour.			*according to their morals.'* Score = 5 (P15, aged 79, female, white, retired) *'Yeah I strongly agree. If you ask me what my personal values are it's very hard to say because it's just what feels right. Doing a good thing. It's how you're brought up.'* Score = 6 (P20, aged 29, male, Asian, employed)
11. I go out of my way to avoid situations that might bring difficult thoughts, feelings, or sensations	Openness to Experience (Acceptance)	The majority of respondents made reference to avoidance as an unhelpful way or a strategy for managing difficult thoughts, feelings and sensations. There was also direct reference to acceptance or "getting on with it". Participants linked this item to a previous openness to experience item (item 2) and a valued action item (item 7) indicating the	Primary process: Acceptance Secondary process: Valued action	0-5	*'No I'm not a person who goes out of their way to avoid. I'm someone who gets on with it and if I have to deal with it I do. I don't run away from stuff.'* Score = 1 (P22, aged 58, female, white, retired) *'This links back to number 7 in terms of making choices even if they're stressful. I wouldn't avoid the situations that might cause me upset or feel stressed about something. I might avoid it for a little bit longer but I generally try and confront things earlier to make the stress or the difficult thought or feeling or sensation be as little as possible.'*

		item may also elicit thoughts about valued action in some responders.			Score = 2 (P6, aged 40, male, white, employed) *'Yes, if it were possible to avoid a situation that I knew was going to make me feel that way, yes it's possible I may go out of my way to avoid it but probably if I went back to number 7, I'm looking at making choices based on what's important to me, if it's stressful and something I had to do, I probably would still choose to do it.'* Score = 4 (P1, aged 32, female, white, employed)
12. Even when doing the things that matter to me, I find myself doing them without paying attention	Behavioural Awareness	The majority of respondents focused on the phrases "matter to me" and "paying attention" and found this easy to formulate a response. The item was linked to a previous behavioural awareness item (item 3) by three participants. Three respondents talked about how some familiar, but important tasks can be	Primary process: Committed action Secondary process: Mindfulness	0-5	*'I think if things are important I pay attention to doing them properly.'* Score = 0 (P13, aged 64, male, white, retired) *'I think it's one of those where I find it really hard to define what matters to me. I don't really have set things that this is important to me and I must do it. Answered with a 3 because unsure ab out identifying what matters to me.'* Score = 3 (P3, aged 28, male, white, employed) *'Depending on how used to doing what you're*

		performed less attentively but the focus of this was the familiarity of the task. A few participants found it difficult to define “the things that matter to me”.			*doing. Some things you can do half asleep or not paying attention. But you're still doing them even though they don't have your full attention.’* Score = 5 (P20, aged 29, male, white, employed)
13. I am willing to fully experience whatever thoughts, feelings, or sensations come up for me without trying to change or defend against them	Openness to Experience (Acceptance)	Respondents seemed less likely to "strongly agree" due to the nature of the phrase "fully experience" which seemed less attainable. There were a range of definitions for fully experience (e.g. "overwhelmed by feelings" or "sitting and meditating with your thoughts"). A few participants linked this item with previous openness to experience questions (items 2, 8 and 11).	Primary process: Acceptance	1-5	*‘I think nobody does that, I think some sensations and feelings we don't want to deal with so we bat them back. There's stuff that I'm not willing to fully experience.’* *Score = 1* (P4, aged 50, female, white, employed) *‘I read it and was really unsure as to whether or not I do or don't do that. I would like to think I am open to whatever and experience things without trying to change them but I think sometimes - especially in relation to how I've answered previous questions - do I tell myself not to think certain things? Well yes I do that. So that's why I put 3.’* Score = 3 (P26, aged 30, female, white, employed) *‘I guess 'I'm a they are what they are kind of person'. I can't think of any examples where I've*

					avoided or wanted to change them I don't think. I'm fairly accepting of what's happening.' Score = 5 (P13, aged 64, male, white, employed)
14. I undertake things that are meaningful to me, even when I find it hard to do so	Valued Action	The majority of respondents focused on the word "meaningful" and how this impacts behaviour. Responses conveyed a sense of valued action with patterns of action being associated with what is meaningful to participants. There was reference by a few participants to the item being similar to item 7 and therefore their responses were in line with that. One participant found this question difficult to relate to and this was therefore reflected in their response and score.	Primary process: Committed action	1-6	*'I think if they're meaningful they wouldn't be hard. If it's a physical thing that's different. But if it's meaningful I wouldn't imagine it would be hard.'* Score = 1 (P22, aged 58, female, white, retired) *'That's like at the minute I really want to [pursue a certain profession]. I'm going through the application and it's been going on for a couple of years. That's meaningful to me and it's getting quite hard now but you just keep pushing through. It'll be worth it in the end.'* Score = 5 (P17, aged 20, female, white, unemployed) *'That just reminds me of some of the earlier questions about not avoiding. If something was meaningful I would do it even if it was really hard.'* Score = 6 (P24, aged 27, female, white, employed)

15. I work hard to keep out upsetting feelings	Openness to Experience (Acceptance)	Responses reflected a consistent definition of what "working hard" meant with common themes being avoidance, distraction, blocking out. Some responses discussed 'working hard to keep out upsetting feelings' in the context of being a coping strategy.	Primary process: Acceptance	0-4	*'No I don't. Upsetting feelings happen and need to be dealt with. I don't work hard to do so but I might not want to have them.'* Score = 0 (P11, aged 60, male, white, retired) *I don't think that applies to me. Physically work hard? Or mentally? I don't know if I do that particularly I think I sit and think about it.'* Score = 1 (P15, aged 79, female, white, retired) *'That one was interesting for me in terms of my coping strategies. Does keeping out mean avoiding or does it mean accepting and pushing that emotion down to not show it? I went with that one because that's the one I resonate with more. I would say that sometimes I do keep out upsetting feelings especially in situations where I don't want that to hold me back. Sometimes I feel it's good to do that to be able to get through, like a defence mechanism but sometimes I know it's not always helpful.'* Score = 4

					(P19, aged 23, female, white, employed)
16. I do jobs or tasks automatically, without being aware of what I'm doing	Behavioural Awareness	The wording "jobs or tasks" meant most respondents focused on routine jobs or tasks which become well practiced and more likely to be carried out on "autopilot". Most respondents agreed with the statement.	Primary process: Mindfulness	0-6	*'I strongly disagreed because I think most of what I do is thought through. I thought, I don't, well maybe sometimes I do things without being aware of it because you're totally on autopilot but even 'strongly disagree' doesn't fit because the question isn't 'I never do that'. I don't know, maybe by disagreeing you're saying you never to that. I just didn't agree that was how I normally am.'* Score = 0 (P2, aged 36, male, white, employed) *'I put 3 because I do think I go on autopilot sometimes. I do things without realising. But I never do it for anything that I need to be present for. It's the less meaningful activities where I go on autopilot.'* Score = 3 (P7, aged 26, female, white, employed) '*Yeah that's me. I strongly agree with that one. I do go into autopilot. When I'm stressed I can whiz through the house quicker than ever before.'* Score = 6 (P4, aged 50, female, white, employed)

17. I am able to follow my long-term plans including times when progress is slow	Valued Action	The majority of respondents answered this question quickly and decisively, agreeing with the statement. This item resonated with current life goals. Most participants focused on career to some degree when answering.	Primary process: Committed action	1-6	*'It would wind me up if a plan I've got even if its long term is taking a long time. I like to get on with it. I'd find it frustrating. So am I able to follow my long term plans? Probably not, I'd probably change it.'* Score = 1 (P18, aged 23, male, white, employed) *'The reason I put that is because I thought about 2 scenarios. Career ambitions I have followed and I'm in the position I'm in now because I have been so committed to it and I'm where I am because of that. With the house renovation we've been working on it a long time. So I obviously am committed to things even when progress is slow but that's not to say I don't get frustrated by it. When progress is slow it's hard to keep momentum going sometimes. I don't give up but it tests my patience. The end goal keeps me from giving up.'* Score = 3 (P8, aged 30, female, white, employed) *'Agree. I think I feel quite comfortable with that. I just ride the waves and go for that end goal.'* Score = 6

					(P10, aged 46, female, white, employed)
18. Even when something is important to me, I'll rarely do it if there is a chance it will upset me	Openness to Experience (Acceptance)	Most respondents focused on 'what's important' which determined whether they were likely to do something regardless of it upsetting them. Some related the item to earlier items about committed action.	Primary process: Committed action Secondary process: Acceptance	0-5	*'That's just not how I operate. I'll do things that I don't like. I've got to. I wouldn't get anywhere if I lived my life like that.'* Score = 0 (P25, aged 36, male, white, employed) *'This question is more or less the same as the other question. If you want to make a loved one happy you might do it even if deep down it might upset you. Because it might not be suitable for me but you do it for others. It's about the value of the thing. Because the value is the difference.'* Score = 3 (P21, aged 65, male, Asian, retired) *'I don't like things to upset me if necessary so I strongly agree with that. Don't know whether it's upset. Sometimes it's just the pressure of getting something done you need to do.'* Score = 4 (P14, aged 75, female, white, retired)
19. It seems I am "running on automatic" without much awareness	Behavioural Awareness	The majority of respondents disagreed with the item feeling it conveyed a sense of	Primary process: Mindfulness	0-5	*'I can't think of any time I've been running on automatic without being aware of what I'm doing. It's asking if that's my default position and no it never is.'*

of what I'm doing		running on automatic all the time which they did not feel was true of them. There was a general description of respondents feeling they were careful and aware as opposed to "vacant", "disengaged" or "robotic".			Score = 0 (P13, aged 64, male, white, retired) *'It's rarely the case. It will happen in certain situations but generally I find being an attentive person I'm quite aware of what's going on around me. I find it difficult to switch my mind off and cruise along a path of least resistance. I'm too intrigued by what's going on.'* Score = 1 (P6, aged 40, male, white, employed) *'I'm wondering about the word 'awareness' and whether that was any different to one of the ones above. I definitely associate with running on automatic. I think in the moment when I'm running on automatic I just let things wash over me. I just think 'oh yeah that's another thing to add to the list, keep them coming'.'* Score = 4 (P1, aged 32, female, white, employed)
20. Thoughts are just thoughts – they don't control what I do	Openness to Experience (Defusion)	Respondents typically took the longest to answer this question, particularly in the concurrent condition.	Primary process: Defusion	0-6	*'I'd say thoughts are very much what make you do things. Thoughts aren't just one thing and then you do something else. Thoughts are literally what's going on in your brain so if you're doing something it's going to have to have a thought or*

		There was divergence in responses with 14 respondents scoring the item 4-6 (slightly agree - strongly agree), 9 respondents rating the item 2 or below, and 3 respondents rating it as 3. Responses reflected openness to experience in relation to defusion. Those who agreed with the item conveyed a sense of distance from their thoughts whereas those who disagreed tended to consider how thoughts were driving their behaviour.			*a feeling or some sort of drive to do it. So I'll strongly disagree because my thoughts do control me.'* Score = 0 (P18, aged 23, male, white, employed) *'I've gone in the middle because thoughts are just thoughts but of course they control what I do. It's a bit of a contradiction. I found that one the most difficult of all of them. To a great extent yes they are just thoughts. Some I dismiss but others you can't dismiss. Sometimes but not always they do control what I do. I think and then I make a decision about what I must do.'* Score = 3 (P11, aged 60, male, white, retired) *'Sometimes you think of something but it doesn't control what I do. Sometimes you might sit and think about something but when it comes to the action you don't do what you were thinking about. You think about lots of things but in actual life they don't control what I do.'* Score = 5 (P21, aged 65, male, Asian, retired)
21. My values are	Valued Action	Most participants talked	Primary process:	1-6	*'Once again, this statement about values is*

really reflected in my behaviour		about a general sense of feeling as though they behaved in line with their values. Those who focused on the word "really" were less likely to strongly agree with the statement. Eight respondents compared it with item 10 and answered similarly or the same.	Committed action		*probably more on the disagree than agree because my behaviour is not reflective at times.'* Score = 1 (P18, aged 23, male, white, employed) *'It would be an easier question to answer if it were 'my values are reflected in my behaviour'. But "really" is in there. It probably means that you're something out of the ordinary. It's harder to answer. I'd probably say slightly agree for that, whereas if it didn't say 'really' I'd say strongly agree.'* Score = 4 (P1, aged 32, female, white, employed) *'I'm just who I am I don't really think about it. I guess it's strongly agree. It's my values and how I act. I'm fairly chilled and that's my relaxed approach to life.'* Score = 6 (P20, aged 29, male, Asian, employed)
22. I can take thoughts and feelings as they come, without	Openness to Experience (Acceptance)	Responses ranged in theme; thoughts and feelings cannot be controlled, negative	Primary process: Acceptance	1-6	*'Can I? I think I've got to disagree, I'd like to think that I do but if I'm honest I don't.'* Score = 1 (P12, aged 62, female, white, retired)

attempting to control or avoid them		thoughts or feelings are more likely to be controlled or avoided, and that control is seen by some as an effective way of managing thoughts and feelings. Avoidance tended to have more negative connotations.			*'I thought sometimes, but then I can think of other examples when I do attempt to control or avoid them.'* Score = 3 P2, aged 36, male, white, employed) *'I don't think you can control them because they're just things that pop up in your head. Easy to answer because I don't try to control or avoid them.'* Score = 5 (P3, aged 28, male, white, employed)
23. I can keep going with something when it's important to me	Valued Action	Respondents answered this item very quickly and decisively. Many linked it back to other items measuring valued action. All respondents agreed with the item.	Primary process: Committed action	4-6	*'Yeah, again, your goals. You're going for them. It hasn't got the word meaningful in but it's the same thing. You've got an objective, you go for it.'* Score = 4 (P16, aged 86, male, white, retired) *'Yes. I instantly refer back to those other two ones which are the 'if it's important to me then I'll put up with the stress' or whatever those ones were. If something is important to me there's a personal connection there and you're invested in it and it's something you want to achieve and if it's important to you, you find a way to make it*

	happen. So there's always some sort of reserve that you can draw on for something that's important to you.' Score = 5 (P1, aged 32, female, white, employed) *'Yeah. When it's important just do it. Don't procrastinate, just go and do it.'* Score = 6 (P17, aged 20, female, white, unemployed)

Note. Scoring criteria for the CompACT: 0 = strongly disagree, 1 = moderately disagree, 2 = slightly disagree, 3 = neither agree nor disagree, 4 = slightly agree, 5 = moderately agree, 6 = strongly agree.

Table 4. Presentation of analysis of each item of the AAQ-II.

AAQ-II Items	Target ACT Process	Analytical Summary	Primary/Secondary (if applicable) ACT Process(es)	Response Range	Example Quotations and Item Score Provided (Participant Number and Demographic Characteristics)
1. My painful experiences and memories make it difficult for me to live a life that I would value	Experiential avoidance	Responses ranged from participants stating that painful memories and experiences have made them stronger to stating they have had a negative impact on their lives at times. For a few participants, painful experiences and memories impacted on valued living, but for most, they did not. Participants also discussed how difficult these experiences can be, but that life still continues to be of value. Some participants struggled to relate to this	Primary process: Acceptance/experiential avoidance	1-5	*'Yes, we have been through quite a bit of family trauma. A lot of it was over phone calls [bad news via phone calls] and so strangely enough my one bit of mental health is fear of phone calls so when I'm driving and the phone rings and it's not someone who should be ringing at that time my heart skips a bit. It doesn't stop me doing what I want to do. If anything it drives me forward because I can see how short life is and stuff like that.'* Score = 5 (P18, aged 23, male, white, employed) *'[It] goes back to my sister and her mental illness because I think that has scared me with a lot of things. And I think because I went through it with her. Not because I had it but I've supported her with it, I think it's made me a bit...like with University, I couldn't ever go to university now after that. But sometimes I'm like 'get a grip'.'* Score = 3

		item as they could not identify painful experiences or memories.			(P17, aged 20, female, white, unemployed) *'Never true. I think it's the opposite. They make it easier for me to live a life I'd value. I can go back to stuff in my past that's probably made me a better person now.'* Score = 1 (P4, aged 50, female, white, employed)
2. I'm afraid of my feelings	Experiential avoidance	Most respondents could define what they felt being afraid of their feelings meant, often making reference to blocking and avoidance as strategies to manage feelings. Some talked in terms of being afraid of feelings stopping them from doing the things they want to do or impacting on their behaviour/responses in some way whereas others talked in terms of being accepting of feelings. Participants	Primary process: Acceptance/experiential avoidance	1-4	'I think I'm good at processing how I'm feeling and then reacting to that. Thinking about how to answer the question I thought about the emotions I normally have in a day and what I do with them. [How do I] know if afraid of them? I'd be worried they'd be happening repetitively. I'd probably go out of my way to avoid having those feelings. But I didn't feel this was something I do.' Score = 1 (P3, aged 28, male, white, employed) 'At some points in the past how I've felt has maybe scared me a little probably because it's the first time I've felt those kinds of feelings; worried or scared about certain things. But thinking about it in the round it's not something that is an issue now. [What is] being afraid - thinking that your feelings take over how you are as a person and what your

		discussed the extent to which they are willing or unwilling to connect with private experiences.			actions are. Becoming a self-fulfilling prophecy and snowballing. Get in a vicious circle.' Score = 2 (P6, aged 40, male, white, employed) *'I think I'm someone who can respond quite quickly to my feelings if I'm not careful and that would make me afraid of them because it's not always helpful to have a knee jerk reaction to something and that causes problems. I might be aware of the depth of my emotions sometimes that might be overwhelming rather than afraid of them. Your feelings can be overwhelming and therefore you think I'd rather not go there. Afraid is quite a strong word, I don't think [I'm] afraid necessarily of the content of my feelings.'* Score = 4 (P12, aged 62, female, white, retired)
3. I worry about not being able to control my worries and feelings	Experiential avoidance	Many respondents talked about whether they would class themselves as a "worrier" or not. Control was focused on by most with it often being referred to as an important method of	Primary process: Acceptance/experiential avoidance	1-4	*'I don't worry about not being able to control worries and feelings. It was in the worry part that was the difference between 1 and 2. I don't consciously worry about not being able to control my worries or feelings but perhaps if you've had negative feelings you can worry about them in the sense that they can be frightening because you don't necessarily know where they've come from, how long they're*

		coping rather than as something which was problematic.			*going to last. But I don't worry that in the future I won't be able to control them.'* Score = 1 *'I'm quite aware of my emotions and worries and feelings. In terms of control, I would associate that with resilience. So for me, I kind of replaced control with resilience. Because I think I am a very resilient person because of what I've had to go through at such a young age.'* Score = 2 (P19, aged 23, female, white, employed) *'Being in control is really important. My worries, feelings and emotions and being in control of them is really important to me and it does worry me to not be in control of them.'* Score = 4 (P25, aged 35, male, white, employed)
4. My painful memories prevent me from having a fulfilling life	Experiential avoidance	Many respondents linked this item to item 1 and felt this was a similar statement. There was similar focus on potential positive growth from painful memories. Those	Primary process: Committed action Secondary process: Primary process: Acceptance/experient ial avoidance	1-4	*'That's linking back to number one that I personally would struggle to quickly identify what I would be drawing upon as painful memories because I haven't got anything immediately that I would associate with that. I don't think there's anything in my past that's currently preventing me, or negatively affecting me and my life at present. [A]*

	who talked about painful memories did so from the perspective of how it has impacted their life, either positively or negatively. Respondents largely drew on the same experiences as in item 1. Some participants found it difficult to identify the occurrence of painful memories.	*fulfilling life is probably one with meaning and probably one where you feel like you've filled it with everything you think is important.'* Score = 1 (P1, aged 32, female, white, employed) *I was thinking, 'no I definitely don't do that' but then I thought about a situation and when that caused me pain, that's prevented me from embarking quite so bravely on new things [relationships]. It might make me more guarded or careful. But it was interesting because instantly I thought about certain painful memories are part of the reason why I have some of the values which I would determine as being fulfilling.* Score = 2 (P7, aged 26, female, white, employed) *'I would say the same response as the first one. In terms of painful, that takes me straight back to my mum's bereavement and dad's diagnosis of cancer. In terms of preventing me from having a fulfilling life, I'm looking at others in terms of what they've got or are doing. And I might think 'oh well I can't do that' and that's the barrier. I feel like it does hold me back. I connected it to the first question.'*

					Score = 4 (P19, aged 23, female, white, employed)
5. Emotions cause problems in my life	Experiential avoidance	Respondents focused on the impact of emotions and how these could be problematic. Some talked about acceptance of emotions as they are whereas others talked about methods of managing or coping. Many of the participants spent time considering what problems were.	Primary process: Unclear	1-5	*'No. You see, why would they? They're normal.'* Score = 1 (P15, aged 79, female, white, retired) *'I'm thinking that I know that stress can be an issue at times…I struggle to unwind so that's where I'd say it's a 3 but I don't think it causes a massive problem but its frustration because you might want to get on with something or you can't be in the moment. It depends on whether you've had a particularly bad day that might stick with me. It doesn't stop me from doing something but it might stop me from enjoying my evening or weekend because of it.'* Score = 3 (P9, aged 28, male, white, employed) *'I wouldn't say problems. It's how you deal with emotions. Whether you let it affect your life for a long time or get on with it.'* Score = 4 (P5, aged 50, female, white, employed)
6. It seems like most people are	Experiential avoidance	Many respondents talked about not focusing on	Primary process: Unclear	1-5	*'No, I know I'm not doing it perfectly, there's lots of things like my house is a mess and all this sort of*

handling their lives better than I am	making comparisons with others making “never true” as an answer which misrepresented their response. Respondents also talked about comparison being difficult because you often do not know what is happening in another person's life. Some participants answered confidently that they felt they were handling their lives better than others but found it difficult to give detail about why that was.	*thing but I'm thinking about the important things. I'm looking after my grandchildren and things. So no I'm not a keeping up with the jones's sort of person which is kind of what that infers really.’* Score = 1 (P14, aged 75, female, white, retired) *‘Outwardly you look at loads of people and think they're so together, [the] social media aspect of it, they look like they have a perfect life. You don't really know them. You see snippets of that. I have a great life but I look at others and think it’s better than mine. Even though I know I've got a good life. It creeps in.’* Score = 3 (P26, aged 30, female, white, employed) *‘Well you look at your peers. We had a [school] reunion they were all in high positions, I thought 'you've missed out somewhere here'. There's always a comparison but it should be about what contribution you're making as opposed to what salary you're earning that's the key. Might be times of looking at others and thinking they're better.’* Score = 4 (P16, aged 86, male, white, retired)

7. Worries get in the way of my success	Experiential avoidance	Most participants considered success in relation to work/career rather than personal success. Although a small number of participants viewed this differently. Discussions about success related to how determination of success is relative and individual to the person. Participants talked about the extent to which worries get in the way of their success.	Primary process: Acceptance/experiential avoidance Secondary process: Committed action	1-4	*'No. Not a worrier. For the reasons I've mentioned earlier. If I'm driven to want to get somewhere or be successful I don't worry. I take things as they come. Success - I naturally associate that word with career. It's used in business terminology a lot. You don't associate the word success with life.'* Score = 1 (P8, aged 30, female, white, employed) *'No. What does it mean by success? I think it's when you can be at ease with yourself and know that whatever you've done you've done the best of your ability and people around you, if you've affected their life in a positive way. It's not money, not because someone's driving a better car then me, that is not success. Success is being comfortable in your own skin and how you've affected the people you care about most and if they're happy and you've done your best in your situation then you've been successful. Worries don't get in the way of your success.'* Score = 2 (P22, aged 58, female, white, retired) *'I thought initially I was going to go 2 or 3 but then I was thinking of examples and thought 'well that's*

	not true because sometimes you do worry about things and that probably does get in the way of your success'. So even if it was something like, 'I'm worried about having to go and do this TV interview on a Sunday morning at work so I'm not going to do it' because that could be a really difficult thing to do therefore it would get in the way of my success. When I answered the question probably like a lot of these things, probably I was thinking about a work context.' Score = 4 (P2, aged 36, male, white, employed)

Note. Scoring criteria for the AAQ-II: 1 = never true, 2 = very seldom true, 3 = seldom true, 4 = sometimes true, 5 = frequently true, 6 = almost always true, 7 = always true.

Discussion

In the following section additional discussion of pertinent points not explored in the journal paper due to constraints in word limits will be presented. Discussion of findings relating to the additional fourth aim will also be presented. More detailed appraisal of the strengths and limitations of the study, the implications for clinical practice, and how the work adds to the body of scientific knowledge and differs from previous literature will be discussed.

Extended comments on responses to items 1 and 4 on the AAQ-II

Some of the responses to the items “my painful experiences and memories make it difficult for me to live a life that I would value” and “my painful memories prevent me from having a fulfilling life” focused on how some painful experiences and memories had made participants appreciate or value life more. Responses of this nature seemed to link with the concept of post-traumatic growth, where an individual experiences a positive change as a result of struggle with highly challenging life crises (Tedeschi & Calhoun, 2004). This was particularly apparent for those participants who when drawing on painful experiences and memories, talked about experiencing the death of a child or parent, or the painful break-down of a marriage. Trauma processing theories suggest recovery requires processing and integration of trauma related information. Attempts to do this often involve some level of exposure to trauma related thoughts, memories, emotions, or images (Batten, Orsillo, & Walser, 2005). Aspects of these theories link with ACT, as the basic assumption is that to adequately process traumatic events, an individual must be willing to be in contact with private events (acceptance). Difficulty engaging with private events relating to trauma experiences to the extent where it results in an inability to commit action toward life values is reflective of experiential avoidance, which may be an important concept to consider in the context of post-trauma coping and reactions. A study by Kashdan and Kane (2011) researched the role of experiential avoidance as a moderator of post-traumatic distress and presence of post-traumatic growth. They found that those exhibiting post-traumatic distress or symptoms but lower levels of experiential avoidance were more

likely to report higher levels of post-traumatic growth and greater meaning in life compared to other trauma survivors demonstrating the role of experiential avoidance in this process. Other studies further support the relationship between ACT processes and trauma, where experiential avoidance is linked to greater post-traumatic stress disorder (PTSD) symptom severity, and mindfulness and acceptance associated with higher levels of psychological adjustment following a traumatic experience (Thompson, Arnkoff, & Glass, 2011).

Discussion of Item 3 on the AAQ-II

It was not possible to include detailed discussion of the findings of the third item of the AAQ-II – "I worry about not being able to control my worries and feelings" in the journal paper, as all individual items could not be focused on in detail, however, some points warrant discussion in the extended paper.

Within the context of ACT, control over private events is viewed as contributing to and maintaining psychological difficulties, therefore intervention focuses on helping clients reduce their desire to control. Many of the participants talked about control in the context of it being a method of coping, rather than something which was problematic. The perception of having control and the link to psychological health is well documented in the literature (Folkman, Lazarus, Gruen, & DeLongis, 1986; Fontaine, Manstead, & Wagner, 1993). Furthermore, a focus of many therapeutic models is on developing coping strategies, with which to manage "symptoms" more effectively. It is unsurprising then that participants considered control to be an important coping method to have in their repertoire. This view is understood and considered within the ACT model, where early intervention work incorporates creative hopelessness (exploring unhelpful patterns of experiential avoidance) and encouragement to view attempts to control private events as the problem. Participants in the study were ACT naïve, and given the focus, particularly in western culture to be "in control" of what we think and feel (O'Connor & Shimizu, 2002), it is reasonable that participants viewed attempts to control as functional and helpful.

Further Comments Relating to Low Frequency Issues

In the following section, further discussion of low frequency issues on the CompACT and the AAQ-II and how this relates to the four-stage cognitive model of the question-answer process (Tourangeau, 1984) will be discussed as this was not covered in the journal paper.

On both measures, low frequency issues related to limited applicability. On the CompACT, other low frequency issues were also inconsistent verbal and written responses, difficulties defining or qualifying concepts, and one occasion where a participant misunderstood the item. While problems with lack of applicability and difficulties defining or qualifying concepts did not impact on the overall comprehension or interpretations of the items (demonstrated in participant responses), these problems were indicative of an issue at the judgement stage of the question-answer process (Tourangeau, 1984), suggesting a difficulty in appropriately assessing the information relevant to formulate a response. While comprehension and interpretation was our primary concern in this study, it is relevant to consider the cognitive processes that follow the comprehension stage, as if participants find it more effortful to make judgements on certain items, this may result in the use of reductive heuristics to save time or effort, resulting in invalid responses, or they may become frustrated and discontinue.

Comments on Measurement of Psychological Flexibility

The AAQ-II has been criticised for its failure to capture the dynamic, contextually specific process of psychological flexibility by using too static a measure (Kashdan & Rottenberg, 2010). This point is also applicable to the CompACT, which similarly attempts to measure psychological flexibility in a static way. This raises a question about the extent to which or the success with which psychological flexibility can be adequately measured using a self-report instrument. Kashdan and Rottenberg (2010) suggest that measures or assessments of psychological flexibility should represent a sense of temporality and person-situation interactions, which would also be reflective of the context-specific, dynamic nature of ACT. There is acknowledgement however, that measurement in this way would be difficult practically to deliver, but

consideration of this would be useful alongside traditional methods of measuring psychological processes.

Concurrent versus Retrospective CI

As highlighted by Wright et al., (2019), there was a lack of consensus regarding methodological processes of CI with respect to its application either retrospectively or concurrently. The current study aimed to test out whether the different approaches yielded differences which might have implications for best practice recommendations for CI studies. This was examined by looking for differences between the two groups in terms of scores on the measures. T-tests revealed no significant differences in the mean scores on either the CompACT or the AAQ-II for either group indicating that the condition of CI (retrospective or concurrent) did not result in any difference in scores. Effect size calculations did demonstrate medium effect sizes for both measures however, perhaps suggesting that with a larger sample, some significant difference may be observed. The results of the current study however cannot conclude any difference between these two groups. Qualitatively however, there were some differences noted by the interviewer. In the retrospective condition, there were times that participants commented that after discussing their thought processes they would change their scores as a result or became unsure about the answer they had provided. This could be interpreted in two ways, either the process of exploring the question-answer process in real time, as with concurrent interviews resulted in participants coming to an answer they felt more confident in, or the process of concurrent interviewing altered the question-answer process in some way. By elongating this process, perhaps some participants came to different answers than if they had been allowed to respond to items without being asked to verbalise thought processes. This links to previous discussion in the literature regarding the benefits and drawbacks of concurrent versus retrospective approaches, where it has been suggested that concurrent interviewing creates an unrealistic environment with which to complete measures (Wright et al., 2019). Tourangeau and Rasinski (1988) discuss the issue of time pressures in terms of how this impacts on the response process. This links particularly to the retrieval and judgement stages in the question

answer model (see Figure 2). They indicate that in the context on completing a self-report measure, the response process is likely to be carried out somewhat superficially as time pressures do not allow for all beliefs or relevant thoughts on an issue to be retrieved, therefore the focus of the retrieval process is to gather a sample of the most accessible beliefs. The judgement stage is also likely to be scaled down, and rather than a complex process of judgement across a range of dimensions, judgement of salient points is more likely to take place. This is the process we might see reflected in retrospective CIs, where participants complete the measures under real time pressures, and thus the cognitive processes complete the task accordingly, using the resources at hand. The action of interviewing concurrently may serve to open out this process, allowing participants more time to retrieve and make judgements in order to develop a response. This may not result in any difference in terms of the actual response provided, certainly, it was not the case that each participant who completed a retrospective CI expressed a wish to change all answers to all responses. But perhaps there might have been a slight shift in responses if given more time to complete the measures. When considering the impact of retrospective and concurrent conditions on cognitive processes, it is also important to consider the power of the accessibility of a belief (Tversky & Kahneman, 1973). Given less time to respond, individuals are more likely to retrieve information most readily and easily accessible, however, this does not necessarily make for an accurate representation of the individual's views or memories. Tourangeau and Rasinski (1988) talk about the static and dynamic nature of attitudes. Beliefs form the basis of responses, which exist statically in memory stores. However the dynamic process of retrieval in real time potentially introduces instability to those beliefs. Perhaps then, a concurrent method allows for more reliable information regarding individual thought processes to be gathered. Ultimately, this argument could be circular in nature and conclusions regarding best practice are therefore difficult to make. Cognitively, the evidence suggests that allowing more time for responses to be developed may result in more reliable or robust responses which are helpful in the context of the current study where the focus was on exploring how responses mapped onto theoretical concepts and ACT processes. However, we know that this does not reflect the reality of self-report completion measures in

practice. Furthermore, it relies on the individual to approach self-report instruments with a level of intense interest and personal reflection, which again, may be unrealistic in practice. There has been benefit to the current study in adopting both methods however. A sense of how individuals respond in real time have been gathered, along with detailed information from individuals who have had more time for consideration and reflection.

Additional Comments Regarding Strengths and Limitations

In the journal paper, the use of CI to complement quantitative methods of instrument analysis and development was briefly mentioned as a strength of the study and this point will be expanded upon here. Using CI allows for the exploration of different information which closely considers how the respondent interacts with the instrument with respect to comprehension, interpretation, retrieval, and response formulation. It would be difficult to explore these factors using quantitative techniques but failing to do so may miss important information relating to the psychometric properties of an instrument (Wright et al., 2019). The original studies assessing the validity and reliability of the CompACT (Francis, Dawson, & Golijani-Moghaddam, 2016) and the AAQ-II (Bond et al., 2011) reported the soundness of the measures, but how the items were understood by respondents was not researched.

A potential limitation of the study was my inexperience of using CI. This may have meant that certain responses could have been explored differently or in more detail had I been more experienced. Any difficulties in using this new method were overcome however through careful reading of relevant literature (Willis, 2005, 2015; Knafl et al., 2007) and conducting pilot interviews which were then reviewed by the second and third authors. I also conducted a systematic review of the methodological processes used in CI studies (Wright et al., 2019) which helped to guide methodological decisions in the current study.

Decisions regarding sample size took much thought and consideration as, is often the case in qualitative research, guidance on optimal sample sizes for CI was limited and published studies varied greatly in terms of recruitment

numbers. Blair and Conrad (2011) suggest sample size is linked to the probability of observing a problem, CI technique, and the number of items in the psychometric instrument being tested. This helped to guide the decision to include 25-30 participants as the number of items in the CompACT and the AAQ-II were relatively small (23 and seven respectively), CIs were planned to be in-depth, using well established techniques and the problems identified were expected to be minimal due to the extent of prior testing and research. The notion of saturation as a commonly cited rationale for sample size in qualitative studies has been criticised because of difficulties ascertaining when saturation has occurred (O'Reilly & Parker, 2013) and analysis of CI studies has demonstrated that new data continues to be generated as sample sizes grow (Willis, 2015), however, saturation was expected to occur due to the homogeneity of the measures (focusing on experiences of thoughts, feelings, behaviour, and personal values, based on the ACT model) therefore there was an obvious consistent theme in items. The sampling strategy could be a potential limitation of the study, as perhaps an alternative strategy could have been used, which may have led to a different sample size, and potentially different findings.

Recommendations for Future Research

The current study explored how respondents understood and interpreted the CompACT and the AAQ-II and related the findings to ACT processes with consideration of how these instruments fared as measures of psychological flexibility. Future research may include CI studies using similar methodology to test other ACT process measures such as the MPFI.

While the findings were not definitive in the current study regarding best practice for the application of CI, either through concurrent or retrospective methods, it may be beneficial to conduct further studies to assess the utility of these methods, and more closely examine how they impact on, or provide information about cognitive processing. This information is vital for CI studies, where understanding of the cognitive processes involved in the question-answer process is essential. A future study could more robustly, or more

closely, examine the impact of the two methods on cognitive processing by paying particular attention to the recall process, which the literature discussed here highlighted as potentially impacted by interviewing retrospectively or concurrently.

While the study was completed with an ACT-naïve, non-clinical sample, it may be of use to replicate the study using an ACT-naïve, clinical sample to investigate whether responses or findings differ in those who are seeking support from services.

Implications for Clinical Practice

Ensuring the validity of ACT-process measures is essential given their use in clinical practice, research, and to inform service delivery. The ability of an instrument to effectively measure as intended depends on its psychometric properties and strengths in capturing concepts and processes as planned (Frost et al., 2007). If instruments are not measuring processes as intended, this has implications for the way they are used, and the conclusions drawn from their findings. Given the intention of ACT is to help individuals increase psychological flexibility and reduce distress, it is important that process measures represent and reflect processes in a way which individuals understand so that ACT interventions can be of utility. The conclusions drawn about the CompACT and AAQ-II based on the findings of the study may help to inform how and why these measures are used with clients in clinical practice going forward.

Contribution of Work

While CI studies are becoming more commonplace in the field of instrument design, this is the first study of its kind to use CI methodology to test ACT process measures, thereby providing a novel contribution to scientific knowledge in this field and differing from other studies assessing the psychometric properties of ACT process measures. As discussed previously, the use of these methods provides different knowledge to previous literature discussing the CompACT and the AAQ-II due to the focus of the study on respondent behaviour and comprehension. It also provides a contribution

towards the critique and ongoing discussion of the AAQ-II with respect to its validity and utility as a process measure of psychological flexibility. Where previous literature has debated the success of the AAQ-II at measuring ACT processes as intended (Tyndall et al., 2018; Wolgast, 2014), the current study adds to this debate, further questioning its use as a measure of psychological flexibility, rather than using it as a stand-alone measure of experiential avoidance. With the CompACT being a relatively new measure, the current study contributes towards a body of work providing further validation of the instrument and to discussions about its use as a measure of psychological flexibility in clinical practice and research, over and above existing ACT process measures.

The work also adds to the wider body of scientific knowledge regarding CI processes and techniques. While conclusions were not drawn regarding the merits of using one CI method (concurrent or retrospective) over another, the study provides a contribution to this continued discussion, or helps guide researchers in planning future CI studies regarding the best CI strategy for their study. The comparison of these two methods within a single CI study differs from other CI studies and provided an interesting opportunity for a methodological investigation to be carried out.

Critical Reflection

In the following section, I will critically reflect on the research process. This will involve discussion of what the process of conducting the research felt like (with particular focus on the process of cognitive interviewing), any challenges in the course of the work and how these were overcome, any ethical or theoretical issues raised, and reflection of the epistemological position as it applies to my research.

Due to the sampling procedure, some participants were recruited from within my network, meaning I had a pre-existing relationship with some of the participants. Although I did not expect interviews to involve discussion of distressing content

or overly personal material, as the interview required them to focus on questions about their thoughts, feelings, and experiences, I wondered whether this might be uncomfortable for them or at times, for myself. It also raised a potential ethical dilemma of whether this interaction would impact on the research negatively. My experience of this in reality was actually very different. I noticed that participants talked openly about their experiences in relation to items in the measures, seeming comfortable to share painful experiences or situations they found upsetting. I have reflected whether this was related to my clinical skills of adopting a non-judgemental, compassionate stance, allowing participants to feel at ease during the interviews. I also think this relates to the setting up of the interviews, where I made it clear that participants could share what felt comfortable, and were under no pressure to go into detail about examples or situations the items made them think about. There was only one occasion when I felt mildly uncomfortable during an interview, which was at the very beginning, where a participant who was known to me was speaking openly about a painful experience I was aware of. I noted my discomfort at the time in my reflective diary, where I wondered whether our shared knowledge of this would be awkward or whether I would need to break out of my role as "interviewer" to make sure I was validating or supportive in a way they might be used to. However, my discomfort was fleeting, as I felt reassured by the way the participant appeared at ease talking openly about this, that they did not seem to require any response from me, that the content of their answer was contained, and that she moved on naturally to the next item on the measure.

A further reflection about the process of interviewing was how different the interviewer-participant relationship felt to a therapeutic relationship. In therapy, the information shared by participants would have been explored or responded to in certain ways, based on therapeutic models or using core therapy skills. This was different in the interviews however, where I was aware of my role as the interviewer and the importance of following the cognitive interview format as outlined in the methodology. I feel I was able to do this well by drawing on prior experience of qualitative research interviewing. I also feel this process was supported through having a good theoretical understanding of cognitive interviewing, where I understood the aims, format, and techniques. As I had not

undertaken cognitive interviews before, I carried out two trial cognitive interviews, one retrospectively and one concurrently and shared the findings with my research supervisors. We discussed these in supervision, and agreed the approach for the rest of the interviews. This helped me to feel confident in using CI.

It is useful to critically reflect on how the research fit with a critical realist epistemology. Critical realist research methods are concerned with a focus on understanding, rather than just describing social reality, therefore it is important that research methods fit and reflect this process of a search for understanding. Reflecting on this research project, the use of CI methods were used appropriately to develop understanding about the utility, comprehension, and interpretation of the CompACT and the AAQ-II. Furthermore, CI methods are about gaining an understanding of respondent behaviour and interaction with the survey instrument, again, fitting with the critical realist stance of an assumption of the existence of an objective world, while also acknowledging that knowledge is subjective and socially constructed. Through the use of research methods grounded in critical realism, an understanding was gained about how particular respondents understood and interpreted the measures.

To go one step further than simply reflecting on the epistemological position of the current study, it is also useful to reflect more broadly on how qualitative methods contribute towards the epistemological position of research into instrument design and analysis. Involving qualitative methods alongside quantitative methods of inquiry in this context allows for a critical realist position to be taken in questionnaire design and analysis, as opposed to the more objective, positivist stance taken when using quantitative methods alone. Knowledge to be gained is complex and multi-layered, where one approach of research methods to assess the suitability and validity of questionnaires may not be enough.

One of the biggest challenges of the research was the development of an analysis strategy. As conducting my systematic review in CI methods taught me (wright et al., 2019), there lacked consensus regarding the process of analysis,

meaning there was not a clearly defined approach to analysing CIs as in the case of conducting an approach like thematic analysis, where Braun and Clark (2006) neatly outline the steps of analysis. The first step to overcome this was to go back to the literature, where I found a useful flow diagram by Willis (2015) depicting analysis models for cognitive interviewing studies (see Figure 3 in the methods section). I also read CI studies where the analysis process had been well reported, to consider the best approach to analysis for this research project (Bergh, Kvalem, Aass, & Hjermstad, 2011; Fortune-Greeley et al., 2009; Heesch, Van Uffelen, Hill, & Brown, 2010; Knafl et al., 2007; Yorkston, et al., 2008). I spent much time developing and re-developing the analysis plan, with the intention that this plan should be well thought out and appropriate for the research aims and data. Through reflection and discussion in supervision, this led to an analysis approach which was tied to the aims of the study. As the aims involved focusing on the behaviour of the respondent (in terms of comprehension and interpretation of items), the behaviour of the evaluated survey items (in terms of problems or issues with items), and consideration of how responses mapped theoretically to ACT processes, an approach to analysis which incorporated these elements was developed. These methods of focusing on the data allowed for a deductive-inductive approach to be used where information was generated from the data, but previous problem coding strategies and the theoretical processes of ACT could be applied to the data. Reflecting again on the approach to analysis, as is the case with qualitative analysis, the approach could have taken a different form, for example, one model could have been the focus of the analysis, potentially simplifying the process. However, I feel that the chosen approach was well suited to addressing the research question and applying different approaches meant that the aims of the study were addressed. The difficulty came that there was no prescribed way of performing analysis, meaning at times I wondered if I was conducting analysis “correctly” or in the most appropriate or helpful way. During these times, focusing back on aims and discussing this in research supervision meetings helped to provide clarity and assure quality of the research. I also made note of thought processes and ideas relating to the analysis plan so that this could be reflected on later in the project. This also served to document the decision making process.

The research involved a great deal of theoretical reflection with respect to ACT processes and how they are operationalised, conceptualised, understood, and communicated. I spent much time debating nuanced points and making notes of these in a reflective diary during the analysis process. The most prominent of these was when considering the CompACT item “I am willing to fully experience whatever thoughts, feelings and sensations come up for me, without trying to change or defend against them” which had been misread by a number of participants, missing out the word “against”. I felt that theoretically this altered how the item was understood in a small way, but I continually kept revisiting this as I was unsure ultimately, if this mattered. This process of revisiting the analysis allowed me to spend time considering the concept of acceptance and theoretically how this was conceptualised within the ACT framework. Which leads me to the final point of reflection, which is that considering how processes are conceptualised and understood by individuals can be difficult, and interpretations differ between individuals but measures can be designed in a way that capture concepts and approaches in ways which are meaningful to individual respondents and to clinicians and researchers. The important point is that comprehension and interpretation from the respondent’s point of view is considered at development and validation stage, so that measures can be designed for appropriate use with the individuals they seek to gain insight into and measure concepts or processes as intended.

Word Count: 32,440

References

Altman, D. G. & Bland, J. M. . (1995). Statistics notes: the normal distribution. *British Medical Journal, 310*(6975), 298. doi:10.1136/bmj.310.6975.298

Archer, M., Bhaskar, R., Collier, A., Lawson, T., & Norrie, A. (2013). *Critical realism: Essential readings.* London: Routledge.

Batten, S. V., Orsillo, S. M., & Walser, R. D. (2005). Acceptance and mindfulness-based approaches to the treatment of posttraumatic stress disorder. In *Acceptance and mindfulness-based approaches to anxiety* (pp. 241-269). Boston, MA: Springer.

Berger, R. (2015). Now I see it, now I don't: Researcher's position and reflexivity in qualitative research. Qualitative research, 15(2), 219-234. doi:10.1177/1468794112468475

Bergh, I., Kvalem, I. L., Aass, N., & Hjermstad, M. J. (2011). What does the answer mean? A qualitative study of how palliative cancer patients interpret and respond to the Edmonton Symptom Assessment System. Palliative Medicine, 25(7), 716-24. doi:10.1177/0269216310395985

Biglan, A., & Hayes, S. C. (1996). Should the behavioral sciences become more pragmatic? The case for functional contextualism in research on human behavior. *Applied and Preventive Psychology, 5*(1), 47-57. doi:10.1016/S0962-1849(96)80026-6

Blackledge, J. T., & Hayes, S. C. (2001). Emotion regulation in acceptance and commitment therapy. *Journal of clinical psychology, 57*(2), 243-255. doi:10.1002/1097-4679(200102)57:2<243::AID-JCLP9>3.0.CO;2-X

Blair, J., & Conrad, F. G. (2011). Sample size for cognitive interview pretesting. *Public Opinion Quarterly, 75*(4), 636-658. Retrieved from https://doi.org/10.1093/poq/nfr035

Bluett, E. J., Homan, K. J., Morrison, K. L., Levin, M. E., & Twohig, M. P. (2014). Acceptance and commitment therapy for anxiety and OCD spectrum disorders: An empirical review. *Journal of anxiety disorders, 28*(6), 612-624. doi:10.1016/j.janxdis.2014.06.008

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., ... & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure ofpsychological inflexibility and experiential avoidance. *Behavior therapy, 42*(4), 676-688. doi:10.1016/j.beth.2011.03.007

Bradbury- Jones, C. (2007). Enhancing rigour in qualitative health research: exploring subjectivity through Peshkin's I's. Journal of Advanced Nursing, 59(3), 290-298. doi:10.1111/j.1365-2648.2007.04306.x

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative research in psychology, 3(2), 77-101. doi: 10.1191/1478088706qp063oa

Cohen, J. (1992). A power primer. *Psychological bulletin, 112*(1), 155-159. Retrieved from https://www.ime.usp.br/~abe/lista/pdfn45sGokvRe.pdf

Collins, D. (2003). Pretesting survey instruments: an overview of cognitive methods. *Quality of life research, 12*(3), 229-238. doi:DOI: 10.1023/A:1023254226592

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological bulletin, 52*(4), 281-302. doi:10.1037/h0040957

Dahl, J. (2015). Valuing in ACT. *Current Opinion in Psychology, 2*, 43-46. doi:10.1016/j.copsyc.2015.03.001

DeMaio, T. J., & Bates, N. (2007). Using Cognitive Research Methods to Improve the Design of the Decennial Census Form. *Survey Methodology, 31*, 1-20. Retrieved from https://www.census.gov/srd/papers/pdf/ssm2007-10.pdf

DeWalt, D. A., Rothrock, N., Yount, S., & Stone, A. A. (2007). Evaluation of item candidates: the PROMIS qualitative item review. *Medical care, 45*((5 Suppl 1)), 12-21. doi:10.1097/01.mlr.0000254567.79743.e2

Elasy, T. A., & Gaddy, G. (1998). Measuring subjective outcomes: Rethinking reliability and validity. *Journal of general internal medicine, 13*(11), 757-761. doi:10.1046/j.1525-1497.1998.00228.x

Ericsson, K. A., & Simon, H. A. (1980). Verbal reports as data. *Psychological review, 87*(3), 215-251. doi:10.1037/0033-295X.87.3.215

Fergus, T. A., Valentiner, D. P., Gillen, M. J., Hiraoka, R., Twohig, M. P., Abramowitz, J. S., & McGrath, P. B. (2012). Assessing psychological inflexibility: The psychometric properties of the Avoidance and Fusion Questionnaire for Youth in two adult samples. *Psychological assessment, 24*(2), 402-408. Retrieved from https://psycnet.apa.org/buy/2011-23143-001

Ferguson, C. J. (2009). An effect size primer: A guide for clinicians and researchers. *Professional Psychology: Research and Practice, 40*(5), 532-538. doi:10.1037/a0015808

Folkman, S., Lazarus, R. S., Gruen, R. J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of*

personality and social psychology, 50(3), 571-579. Retrieved from https://delongis-psych.sites.olt.ubc.ca/files/2018/03/Appraisal-coping-health-status-and-psychological-symptoms.pdf

Fontaine, K. R., Manstead, A. S., & Wagner, H. . (1993). Optimism, perceived control over stress, and coping. *European Journal of personality, 7*(4), 267-281. doi:10.1002/per.2410070407

Fortune-Greeley, A. K., Flynn, K. E., Jeffery, D. D., Williams, M. S., Keefe, F. J., Reeve, B. B., ... & Weinfurt, K. P. (2009). Using cognitive interviews to evaluate items for measuring sexual functioning across cancer populations: improvements and remaining challenges. Quality of Life Research, 18(8), 1085-1093. doi:10.1007/s11136-009-9523-x

Francis, A. W., Dawson, D. L., & Golijani-Moghaddam, N. (2016). The development and validation of the Comprehensive assessment of Acceptance and Commitment Therapy processes (CompACT). *Journal of Contextual Behavioral Science, 5*(3), 134-145. Retrieved from http://dx.doi.org/10.1016/j.jcbs.2016.05.003

French, K., Golijani-Moghaddam, N., & Schröder, T. (2017). What is the evidence for the efficacy of self-help acceptance and commitment therapy? A systematic review and meta-analysis. *Journal of Contextual Behavioral Science, 6*(4), 360-374. doi:10.1016/j.jcbs.2017.08.002

Frost, M. H., Reeve, B. B., Liepa, A. M., Stauffer, J. W., Hays, R.D., Mayo/FDA Patient-Reported Outcomes Consensus Meeting Group. (2007). What is sufficient evidence for the reliability and validity of patient-reported outcome measures? *Value in Health, 10*(2), 94-105. doi:10.1111/j.1524-4733.2007.00272.x

Gámez, W., Chmielewski, M., Kotov, R., Ruggero, C., & Watson, D. (2011). Development of a measure of experiential avoidance: The Multidimensional Experiential Avoidance Questionnaire. *Psychological assessment, 23*(3), 692-713. doi:10.1037/a0023242

Gámez, W., Chmielewski, M., Kotov, R., Ruggero, C., Suzuki, N., & Watson, D. (2014). The brief experiential avoidance questionnaire: development and initial validation. *Psychological assessment, 26*(1), 35-45. doi:10.1037/a0034473

George, D., & Mallery, P. (2016). *IBM SPSS statistics 23 step by step: A simple guide and reference.* Routledge.

Graham, C. D., Gouick, J., Krahe, C., & Gillanders, D. (2016). A systematic review of the use of Acceptance and Commitment Therapy (ACT) in chronic disease and long-term conditions. *Clinical Psychology Review, 46*, 46-58. doi:10.1016/j.cpr.2016.04.009

Greco, L. A., Lambert, W., & Baer, R. A. (2008). Psychological inflexibility in childhood and adolescence: development and evaluation of the Avoidance and Fusion Questionnaire for Youth. *Psychological assessment, 20*(2), 93-102. doi:10.1037/1040-3590.20.2.93

Gregg, J. A., Callaghan, G. M., Hayes, S. C., & Glenn-Lawson, J. L. (2007). Improving diabetes self-management through acceptance, mindfulness, and values: a randomized controlled trial. *Journal of consulting and clinical psychology, 75*(2), 336-343. doi:10.1037/0022-006X.75.2.336

Hann, K. E., & McCracken, L. M. . (2014). A systematic review of randomized controlled trials of Acceptance and Commitment Therapy for adults with chronic pain: Outcome domains, design quality, and efficacy. *Journal of*

contextual behavioral science, 3(4), 217-227. doi:10.1016/j.jcbs.2014.10.001

Harris, R. (2006). Embracing your demons: An overview of acceptance and commitment therapy. *Psychotherapy in Australia, 12*(4), 70-77. Retrieved from https://contextualscience.org/files/article%20psychOz.pdf

Harris, R. (2007). *The happiness trap.* Auckland, New Zealand: Exisle.

Hayes, S. C. (1984). Making sense of spirituality. *Behaviorism, 12*(2), 99-110. Retrieved from https://www.researchgate.net/profile/Steven_Hayes7/publication/232588235_Making_sense_of_spirituality/links/571b2ba608aee3ddc5695adc/Making-sense-of-spirituality.pdf

Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior therapy, 35*(4), 639-665. doi:10.1016/S0005-7894(04)80013-3

Hayes, S. C., & Brownstein, A. J. (1986). Mentalism, behavior-behavior relations, and a behavior-analytic view of the purposes of science. *The Behavior Analyst, 9*(2), 175-190. doi:10.1007/BF03391944

Hayes, S. C., & Wilson, K. G. (1994). Acceptance and commitment therapy: Altering the verbal support for experiential avoidance. *The Behavior Analyst,, 17*(2), 289-303. doi:10.1007/BF03392677

Hayes, S. C., Barnes-Holmes, D., & Roche, B. (Eds.). (2001). *Relational Frame Theory: A post-Skinnerian account of human language and cognition.* New York: Plenum Press.

Hayes, S. C., Levin, M. E., Plumb-Vilardaga, J., Villatte, J. L., & Pistorello, J. (2013). Acceptance and commitment therapy and contextual behavioral

science: Examining the progress of a distinctive model of behavioral and cognitive therapy. *Behavior therapy, 44*(2), 180-198. Retrieved from http://dx.doi.org/10.1016/j.beth.2009.08.002

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour research and therapy, 44*(1), 1-25. Retrieved from http://dx.doi.org/10.1016/j.brat.2005.06.006

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change.* New York; London: Guilford Press.

Hayes, S. C., Strosahl, K., Wilson, K. G., Bissett, R. T., Pistorello, J., Toarmino, D., ... & Stewart, S. H. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The psychological record, 54*(4), 553-578. doi:10.1007/BF03395492

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-based nursing, 18*(3), 66-67. doi:10.1136/eb-2015-102129

Heesch, K. C., Van Uffelen, J. G., Hill, R. L., & Brown, W. J. (2010). What do IPAQ questions mean to older adults? Lessons from cognitive interviews. International Journal of Behavioral Nutrition and Physical Activity, 7(1), 35-47. doi:10.1186/1479-5868-7-35

Hippler, H. J., Schwarz, N., & Sudman, S. (Eds.). (1987). *Social information processing and survey methodology.* New York: Springer Verlag.

Horsburgh, D. (2003). Evaluation of qualitative research. Journal of clinical nursing, 12(2), 307-312. doi:10.1046/j.1365-2702.2003.00683.x

Hsu, C. C., & Sandford, B. A. (2007). The Delphi technique: making sense of consensus. *Practical assessment, research & evaluation, 12*(10), 1-8. Retrieved from https://pareonline.net/getvn.asp?v=12&n=10

Hudson, L. A., & Ozanne, J. L. (1988). Alternative ways of seeking knowledge in consumer research. *Journal of consumer research, 14*(4), 508-521. doi:10.1086/209132

Jabine, T. B., Straf, M. L., Tanur, J. M., & Tourangeau, R. (1984). *Report of the advanced research seminar on cognitive aspects of survey methodology. Cognitive Aspects of Survey Methodology: Building a Bridge Between Disciplines.* Washington, DC: National Academies Press.

James, W. (1998). *Pragmatism: A new name for some old ways of thinking and The Meaning of Truth.* Cambridge, MA: Harvard University Press.

Kashdan, T. B., & Kane, J. Q. (2011). Post-traumatic distress and the presence of post-traumatic growth and meaning in life: Experiential avoidance as a moderator. *Personality and Individual Differences, 50*(1), 84-89. doi:10.1016/j.paid.2010.08.028

Kashdan, T. B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical psychology review, 30*(7), 865-878. doi:10.1016/j.cpr.2010.03.001

Knafl, K., Deatrick, J., Gallo, A., Holcombe, G., Bakitas, M., Dixon, J., & Grey, M. (2007). The analysis and interpretation of cognitive interviews for instrument development. *Research in nursing & health, 30*(2), 224-234. doi:10.1002/nur.20195

Lee, E. B., An, W., Levin, M. E., & Twohig, M. P. (2015). An initial meta-analysis of Acceptance and Commitment Therapy for treating substance use

disorders. *Drug and alcohol dependence, 155*, 1-7. doi:10.1016/j.drugalcdep.2015.08.004

Levin, M. E., MacLane, C., Daflos, S., Seeley, J. R., Hayes, S. C., Biglan, A., & Pistorello, J. . (2014). Examining psychological inflexibility as a transdiagnostic process across psychological disorders. *Journal of Contextual Behavioral Science, 3*(3), 155-163. doi:10.1016/j.jcbs.2014.06.003

Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the depression anxiety stress scales 2nd edition.* Sydney: Psychology Foundation of Australia.

McCracken, L. M., Vowles, K. E., & Eccleston, C. (2004). Acceptance of chronic pain: component analysis and a revised assessment method. *Pain, 107*(1-2), 159-166. doi:10.1016/j.pain.2003.10.012

McKenzie, J. F., Wood, M. L., Kotecki, J. E., Clark, J. K., & Brey, R. A. (1999). Establishing content validity: Using qualitative and quantitative steps. *American Journal of Health Behavior, 23*(4), 311-318. doi:10.5993/AJHB.23.4.9

Miller, K. (2011). Cognitive Interviewing. In J. M. Madans, *Question Evaluation Methods* (pp. 51-75). Hoboken, NJ: Wiley.

Morgan, S. J., Amtmann, D., Abrahamson, D. C., Kajlich, A. J., & Hafner, B. J. (2014). Use of cognitive interviews in the development of the PLUS-M item bank. *Quality of Life Research, 23*(6), 1767-1775. doi:10.1007/s11136-013-0618-z

O'Reilly, M. & Parker, N. (2013). 'Unsatisfactory Saturation': a critical exploration of the notion of saturated sample sizes in qualitative

research. *Qualitative research, 13*(2), 190-197. doi:10.1177/1468794112446106

O'Connor, D. B., & Shimizu, M. (2002). Sense of personal control, stress and coping style: a cross-cultural study. *Stress and Health: Journal of the International Society for the Investigation of Stress, 18*(4), 173-183. doi:10.1002/smi.939

Öst, L. G. (2014). The efficacy of acceptance and commitment therapy: an updated systematic review and meta-analysis. *Behaviour research and therapy, 61*, 105-121. doi:10.1016/j.brat.2014.07.018

Powers, M. B., Vörding, M. B. Z. V. S., & Emmelkamp, P. M. . (2009). Acceptance and commitment therapy: A meta-analytic review. *Psychotherapy and psychosomatics, 78*(2), 73-80. doi:10.1159/000190790

Ridolfo, H., & Schoua-Glusberg, A. (2011). Analyzing cognitive interview data using the constant comparative method of analysis to understand cross-cultural patterns in survey data. *Field Methods, 23*(4), 420-438. doi:10.1177/1525822x11414835

Rolffs, J. L., Rogge, R. D., & Wilson, K. G. (2018). Disentangling components of flexibility via the hexaflex model: Development and validation of the Multidimensional Psychological Flexibility Inventory (MPFI). *Assessment, 28*(4), 458-482. doi:10.1177/1073191116645905

Schultz, K.S., & Whitney, D.J. (2005). *Measurement theory in action.* Thousan Oaks, CA: Sage.

Schwarz, N. (2007). Retrospective and concurrent self-reports: the rationale for real-time data capture. In A. A. Stone, *The Science of Real-Time Data*

Capture: Self-Reports in Health Research (pp. 11-26). New York: Oxford University Press.

Scott, D. (2007). Resolving the quantitative–qualitative dilemma: a critical realist approach. *International Journal of Research & Method in Education, 30*(1), 3-17. doi:10.1080/17437270701207694

Shawyer, F., Ratcliff, K., Mackinnon, A., Farhall, J., Hayes, S. C., & Copolov, D. (2007). The voices acceptance and action scale (VAAS): Pilot data. *Journal of clinical psychology, 63*(6), 593-606. doi:10.1002/jclp.20366

Snape, D. and Spencer, L. (2003). The Foundations of Qualitative Research in . In J. &. Ritchie, *Qualitative Research Practice. A Guide for Social Science Students and Researchers* (pp. 1-23). London: Sage Publications.

Spencer, L., Ritchie, J., & O'Connor, W. (2003). *Analysis: practices, principles and processes. Qualitative research practice: A guide for social science students and researchers.* London: Sage Publications.

Stoddard, J. A., & Afari, N. (2014). The Big Book of ACT Metaphors: a practitioner's guide to experiential exercises and metaphors in Acceptance and Commitment Therapy. New Harbinger Publications.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education, 2*, 53-55. doi:10.5116/ijme.4dfb.8dfd

Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological inquiry, 15*(1), 1-18. doi:10.1207/s15327965pli1501_01

Thompson, R. W., Arnkoff, D. B., & Glass, C. R. (2011). Conceptualizing mindfulness and acceptance as components of psychological resilience to trauma. *Trauma, Violence, & Abuse, 12*(4), 220-235. doi:10.1177/1524838011416375

Tourangeau, R. (1984). Cognitive science and survey methods: A cognitive perspective. In. In M. S. Jabine, *Cognitive Aspects of Survey Methodology: Building a Bridge Between the Disciplines* (pp. 73-100). Washington, DC: National Academy Press.

Tourangeau, R., & Rasinski, K. A. . (1988). Cognitive processes underlying context effects in attitude measurement. *Psychological bulletin, 103*(3), 299-314. doi:10.1037/0033-2909.103.3.299

Trochim, W. M., & Donnelly, J. P. (2001). *Research methods knowledge base (Vol. 2).* Cincinnati, OH: Atomic Dog Publishing.

Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive psychology, 5*(2), 207-232. doi:10.1016/0010-0285(73)90033-9

Tyndall, I., Waldeck, D., Pancani, L., Whelan, R., Roche, B., & Dawson, D. L. (2018). The Acceptance and Action Questionnaire-II (AAQ-II) as a measure of experiential avoidance: Concerns over discriminant validity. *Journal of Contextual Behavioral Science*. doi:10.1016/j.jcbs.2018.09.005

Vallerand, R. J., Blanchard, C., Mageau, G. A., Koestner, R., Ratelle, C., Léonard, M., ... & Marsolais, J. . (2003). Les passions de l'ame: on obsessive and harmonious passion. *Journal of personality and social psychology, 85*(4), 756-767. doi:10.1037/0022-3514.85.4.756

Willis, G. B. (2005). *Cognitive interviewing: A tool for improving questionnaire design.* Thousand Oaks, CA: Sage.

Willis, G. B. (2015). *Analysis of the cognitive interview in questionnaire design.* New York: Oxford University Press.

Wilson, K. G., & Sandoz, E. K. (2008). Mindfulness, values, and the therapeutic relationship in Acceptance and Commitment Therapy. In S. F. Hick, *Mindfulness and the therapeutic relationship* (pp. 89-106). New York: Guilford Press.

Wolgast, M. (2014). What does the Acceptance and Action Questionnaire (AAQ-II) really measure? *Behavior Therapy, 45*(6), 831-839. doi:10.1016/j.beth.2014.07.002

Wright, J., Moghaddam, N., & Dawson, D. L. (in press). (2019). Cognitive Interviewing in Patient Reported Outcome Measures: A Systematic Review of Methodological Processes. *Qualitative Psychology*.

Yorkston, K. M., Baylor, C. R., Dietz, J., Dudgeon, B. J., Eadie, T., Miller, R. M., & Amtmann, D. (2008). Developing a scale of communicative participation: A cognitive interviewing study. *Disability and rehabilitation, 30*(6), 425-433. doi:10.1080/09638280701625328

Appendices

Appendix 1 – Ethics Approval Letter

University of Nottingham
UK | CHINA | MALAYSIA

Email: FMHS-ResearchEthics@nottingham.ac.uk

Faculty of Medicine & Health Sciences
Research Ethics Committee
c/o Faculty PVC Office
School of Medicine Education Centre
B Floor, Medical School
Queen's Medical Centre Campus
Nottingham University Hospitals
Nottingham, NG7 2UH

27 February 2018

Jessica Wright
Trent Doctorate/Trainee in Clinical Psychology
Division of Psychiatry & Applied Psychology
School of Medicine
University of Nottingham
YANG Fujia Building
Jubilee Campus
Wollaton Road
Nottingham, NG8 1BB

Dear Ms Wright

Ethics Reference No: 231-18 – **please always quote**	
Study Title: Testing a novel process measure of acceptance and commitment therapy using cognitive interviewing.	
Short Title: ACT cognitive interviewing study	
Chief Investigator/Supervisor: Dr David Dawson, Research Clinical Psychologist, Dr Nima Moghaddam, Research Clinical Psychologist, Trent Clinical Psychology Programme, School of Psychology, University of Lincoln.	
Lead Investigators/student: Jessica Wright, Trent DClinPsy trainee in Clinical Psychology	
Type of Study: Interviews mixed quantitative/qualitative methodology	
Proposed Start Date: 01/03/2018	**Proposed End Date**: 31/03/2019 12mths
No of Subjects: 25-30	**Age**: 18+years

The Committee considered this application at its meeting on 16 February 2018 and the following documents were received:

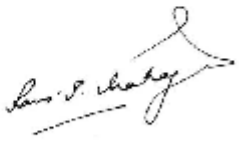
- FMHS REC Application form and supporting documents version 1.0: 25.01.2018

These have been reviewed and are satisfactory and the study has been given a favourable opinion.

A favourable opinion has been given on the understanding that:

1. The protocol agreed is followed and the Committee is informed of any changes using a notice of amendment form (please request a form).
2. The Chair is informed of any serious or unexpected event.
3. An End of Project Progress Report is completed and returned when the study has finished (Please request a form).

Yours sincerely



Professor Ravi Mahajan
Chair, Faculty of Medicine & Health Sciences Research Ethics Committee

Appendix 2 – Participant Information Sheets

University of Nottingham
UK | CHINA | MALAYSIA

Division of Psychiatry & Applied Psychology
School of Medicine
Room B16, B Floor, Yang Fujia Building
Jubilee Campus
University of Nottingham
Nottingham, NG8 1BB

Participants Information Form

Final version 1.0: 15.03.2018

Title of Study: Testing a novel process measure of acceptance and commitment therapy using cognitive interviewing

Name of Researcher(s): Jessica Wright

We would like to invite you to take part in our research study. Before you decide, we would like you to understand why the research is being done and what it would involve for you. One of our team will go through the information sheet with you and answer any questions you have. Talk to others about the study if you wish. Ask us if there is anything that is not clear.

What is the purpose of the study?

The purpose of the study is to find out how people make sense of questions on to two different questionnaires about Acceptance and Commitment Therapy (ACT).

Why have I been invited?

You are being invited to take part because we are recruiting people from the general public with no previous experience of ACT. We are inviting approximately 25-30 participants like you to take part.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

What will happen to me if I take part?

You will be asked to take part in an interview to find out how you understand and interpret two different questionnaires. This interview will take place with the researcher, Jessica Wright either at the University of Nottingham, or a location convenient to you (ensuring there is a quiet space for the interview to take place). You will only be asked to take part in one interview which will last approximately one hour.

During the interview, you will first be asked to give your consent to take part after being given the opportunity to ask any further questions you might have. You will then be asked to fill out a brief questionnaire about how you feel, in order to give an idea about anything which might affect how you fill out a questionnaire. Next, you will be asked to fill out two questionnaires which will ask questions about you and how you think and feel. While you are filling out the questionnaires, the researcher will ask you a number of questions to understand more about how you go about answering the questionnaires. For example, about what you are thinking as you are answering and why you chose to answer each question the way you did.
The interview will be audio-recorded and then partially transcribed so that it can be analysed. All data will be made anonymous.

Expenses and payments

Participants will not be paid to participate in the study, however, participants will be offered the opportunity to be entered into a prize draw following completion

of the study with 1 x £50, 1 x £20 and 1 x £10 Love2shop vouchers available as prizes Travel expenses will be offered for any visits incurred as a result of participation.

What are the possible disadvantages and risks of taking part?

There are no foreseeable risks anticipated. We appreciate that you will be giving up your valuable free time to help us.

What are the possible benefits of taking part?

The information we get from your contribution may help to ensure that a questionnaire about ACT is helpful to individuals who are experiencing psychological distress and are receiving ACT so that it can be better understood what help people need.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. The researchers' contact details are given at the end of this information sheet. If you remain unhappy and wish to complain formally, you should then contact the FMHS Research Ethics Committee Administrator, c/o The University of Nottingham, Faculty PVC Office, B Floor, Medical School, Queen's Medical Centre Campus, Nottingham University Hospitals, Nottingham, NG7 2UH or via E-mail: FMHS-ResearchEthics@nottingham.ac.uk Please quote ref no: FMHS 231-1802.

Will my taking part in the study be kept confidential?

We will follow ethical and legal practice and all information about you will be handled in confidence.

All information which is collected about you during the course of the research will be kept **strictly confidential**, stored in a secure and locked office, and on a password protected database. Any information about you which leaves the University of Nottingham will have your name and address removed (anonymised) and a unique code will be used so that you cannot be recognised from it.

Your personal data (address, telephone number) will be kept for 1 year after the end of the study so that we are able to contact you about the findings of the study and possible follow-up studies (unless you advise us that you do not wish to be contacted). All other data (research data) will be kept securely for 7 years. After this time your data will be disposed of securely. During this time all precautions will be taken by all those involved to maintain your confidentiality, only members of the research team will have access to your personal data. We would also like to seek your consent so that the research data you have given may be stored and used in possible future research during and after 7 years– this is optional (please indicate you agree to this on the consent form).

Although what you say in the interview is confidential, should you disclose anything to us which we feel puts you or anyone else at any risk, it may be necessary to report this to the appropriate persons.

What will happen if I don't want to carry on with the study?

Your participation is voluntary and you are free to withdraw at any time, without giving any reason should you wish to do so, we recommend doing this within 7 days of completing the interview/questionnaire etc. After that point, it may not be possible to remove your data from the study, meaning that it may still be used in our analysis. However, if you have any questions please do not hesitate to contact us.

What will happen to the results of the research study?

The results of the research study will be submitted in order to fulfil the requirements of the Trent Doctorate in Clinical Psychology. It is also intended that the results are published in an appropriate journal. Care will be taken to ensure the confidentiality and privacy of study participants through the exclusion of any personal information.

Who is organising and funding the research?

This research is being organised by the University of Nottingham and is being funded by the Trent Doctorate in Clinical Psychology programme.

Who has reviewed the study?

All research in the University of Nottingham is looked at by independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by the Faculty of Medicine & Health Sciences (FMHS) Research Ethics Committee.

Further information and contact details

Researcher: Jessica Wright
Address: University of Nottingham
Trent DClin Psy Programme
YANG Fujia Building
Jubilee Campus
Wollaton Road
Nottingham
NG8 1BB
Email: msxjw11@nottingham.ac.uk

Supervisor: David Dawson
Address: University of Lincoln
Trent DClin Psy Programme
Bridge House
Brayford Pool
Lincoln
LN6 7TS

Supervisor: Nima Moghaddam
Address: University of Lincoln
Trent DClin Psy Programme
Bridge House
Brayford Pool
Lincoln
LN6 7TS

Appendix 3 – Consent Form

University of Nottingham
UK | CHINA | MALAYSIA

Division of Psychiatry & Applied Psychology
School of Medicine
Room B16, B Floor, Yang Fujia Building
Jubilee Campus
University of Nottingham
Nottingham, NG8 1BB

Participants Consent Form

Final version 1.0: 15.03.2018

Title of Study: Testing a novel process measure of acceptance and commitment therapy using cognitive interviewing

REC ref: FMHS 231-1802

Name of Researchers: Jessica Wright – Trainee Clinical Psychologist (Lead Investigator), David Dawson – Research Clinical Psychologist (Chief Investigator), Nima Moghaddam – Research Clinical Psychologist (2nd Supervisor)

Name of Participant: **Please initial box**

1. I confirm that I have read and understand the information sheet for the above study which is attached and have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. ☐

3. I understand that should I withdraw, more than 7 days after the interview has taken place then the information collected so far cannot ☐

be erased and that this information may still be used in the study analysis.

4. I understand that relevant sections of my data collected in the study may be looked at by the research group and by other responsible individuals for monitoring and audit purposes. I give permission for these individuals to have access to these records and to collect, store, analyse and publish information obtained from my participation in this study. I understand that my personal details will be kept confidential. ☐

5. I understand that the *interview/Focus Group/seminar session etc* (*delete/revise as appropriate) will be audio recorded using a digital device and that anonymous direct quotes from the interview may be used in the study reports. ☐

6. I understand that what I say during the focus group will be kept confidential unless I reveal something of concern that may put myself or someone else at any risk. It will then be necessary to report this to the appropriate persons. ☐

7. I understand that information about me recorded during the study will be made anonymous before it is stored. It will be uploaded into a secure database on a computer kept in a secure place. Data will be kept for 7 years after the study has ended and then destroyed. ☐

8. **Optional:** I agree that my research data may be stored and used in possible future research during and after 7 years, and shared with other researchers including those working outside the University. ☐

9. I agree to take part in the above study. ☐

_____ _____

_____

Name of Participant	Date	Signature
_____	_____	
_____		
Name of Person taking consent	Date	Signature

Appendix 4 – Flexible Cognitive Interview Schedule of Prompts

CompACT Verbal Probes

1. How easy is it to identify the things in life which matter to you? What does it mean to you to pursue these?
2. What are ‘painful emotions’ to you? How would you describe them?
3. What are meaningful activities for you? What would it be like to be attentive to them?
4. Can you think of a time when you have done this? How do you normally ‘keep yourself busy’ if that’s something you do?
5. Is there an example you can think of which helps you answer this question? What helps you to answer this question?
6. What does it mean to ‘get caught up in your thoughts’? Is there an example you can think of which helps you answer this question? What helps you to answer this question?
7. How would you define ‘stressful’? How did you arrive at your answer to this?
8. How do you answer this question? What is the question asking?
9. How do you answer this question? What is the question asking?
10. What does ‘behaving in line with my personal values’ mean to you? What would this look like?
11. What would difficult thoughts, feelings or sensations be for you? How might you avoid them?
12. How did you arrive at an answer?
13. What does ‘fully experiencing’ mean to you? What would it take for you to be able to do this?
14. What would it take for you to be able to do this?
15. How would you define ‘keeping out upsetting feelings?’ what would upsetting feelings be for you?
16. How did you go about answering this?
17. How did you go about answering this?
18. How did you go about answering this? Is it easy or hard to answer this?

19. What does ‘running on automatic’ mean to you? How did you go about answering this? Is it easy or hard to answer this?
20. How do you define ‘thoughts’? What does this question make you think of?
21. How do you define ‘values’?
22. How did you go about answering this? Is it easy or hard to answer this?
23. What does it mean to ‘keep going’?

AAQ-II Verbal Probes

1. How would you define ‘painful experiences or memories’? What would it be like to live a life that you don’t value?
2. What do you think of when you go about answering this?
3. How would one ‘control worries and feelings? How did you go about answering this?
4. What does a ‘fulfilling life’ mean to you? Is it easy or hard to answer this?
5. What are ‘emotions’ for you? How did you go about answering this? Is it easy or hard to answer this?
6. How do you define ‘handling their lives better’? How did you go about answering this? Is it easy or hard to answer this?
7. How do you define ‘success’? How did you go about answering this? Is it easy or hard to answer this?

Appendix 5 - CompACT



Name:	Date:

Please rate the following 23 statements using the scale below:

0	1	2	3	4	5	6
Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Moderately agree	Strongly agree

1. I can identify the things that really matter to me in life and pursue them	0	1	2	3	4	5	6
2. One of my big goals is to be free from painful emotions	0	1	2	3	4	5	6
3. I rush through meaningful activities without being really attentive to them	0	1	2	3	4	5	6
4. I try to stay busy to keep thoughts or feelings from coming	0	1	2	3	4	5	6
5. I act in ways that are consistent with how I wish to live my life	0	1	2	3	4	5	6
6. I get so caught up in my thoughts that I am unable to do the things that I most want to do	0	1	2	3	4	5	6
7. I make choices based on what is important to me, even if it is stressful	0	1	2	3	4	5	6
8. I tell myself that I shouldn't have certain thoughts	0	1	2	3	4	5	6
9. I find it difficult to stay focused on what's happening in the present	0	1	2	3	4	5	6
10. I behave in line with my personal values	0	1	2	3	4	5	6
11. I go out of my way to avoid situations that might bring difficult thoughts, feelings, or sensations	0	1	2	3	4	5	6
12. Even when doing the things that matter to me, I find myself doing them without paying attention	0	1	2	3	4	5	6
13. I am willing to fully experience whatever thoughts, feelings and sensations come up for me, without trying to change or defend against them	0	1	2	3	4	5	6
14. I undertake things that are meaningful to me, even when I find it hard to do so	0	1	2	3	4	5	6
15. I work hard to keep out upsetting feelings	0	1	2	3	4	5	6
16. I do jobs or tasks automatically, without being aware of what I'm doing	0	1	2	3	4	5	6
17. I am able to follow my long terms plans including times when progress is slow	0	1	2	3	4	5	6
18. Even when something is important to me, I'll rarely do it if there is a chance it will upset me	0	1	2	3	4	5	6
19. It seems I am "running on automatic" without much awareness of what I'm doing	0	1	2	3	4	5	6
20. Thoughts are just thoughts – they don't control what I do	0	1	2	3	4	5	6
21. My values are really reflected in my behaviour	0	1	2	3	4	5	6
22. I can take thoughts and feelings as they come, without attempting to control or avoid them	0	1	2	3	4	5	6
23. I can keep going with something when it's important to me	0	1	2	3	4	5	6

Appendix 6 – AAQ-II

AAQ-II

name: _____ *date:* _____

Below you will find a list of statements. Please rate the truth of each statement (for the agreed time period) in the column on the right, using the following scale:

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1.	my painful experiences and memories make it difficult for me to live a life that I would value	
2.	I'm afraid of my feelings	
3.	I worry about not being able to control my worries and feelings	
4.	my painful memories prevent me from having a fulfilling life	
5.	emotions cause problems in my life	
6.	it seems like most people are handling their lives better than I am	
7.	worries get in the way of my success	

total score =

Average (mean) score in a clinical population was 28.3 (SD 9.9); while in a non-clinical population it was 18.51 (SD 7.05). Scores of >24-28 suggest probable current clinical distress and make future distress & work absence more likely.

Bond, F. W., S. C. Hayes, et al. (2011). *"Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure of psychological inflexibility and experiential avoidance."* Behavior Therapy 42(4): 676-688.
The present research describes the development and psychometric evaluation of a second version of the Acceptance and Action Questionnaire (AAQ-II), which assesses the construct referred to as, variously, acceptance, experiential avoidance, and psychological inflexibility. Results from 2,816 participants across six samples indicate the satisfactory structure, reliability, and validity of this measure. For example, the mean alpha coefficient is .84 (.78–.88), and the 3- and 12-month test–retest reliability is .81 and .79, respectively. Results indicate that AAQ-II scores concurrently, longitudinally, and incrementally predict a range of outcomes, from mental health to work absence rates, that are consistent with its underlying theory. The AAQ-II also demonstrates appropriate discriminant validity. The AAQ-II appears to measure the same concept as the AAQ-I (r=.97) but with better psychometric consistency.

Appendix 7 – DASS-21

DASS21

Name: Date:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree or a good part of time
3 Applied to me very much or most of the time

1 (s)	I found it hard to wind down	0	1	2	3
2 (a)	I was aware of dryness of my mouth	0	1	2	3
3 (d)	I couldn't seem to experience any positive feeling at all	0	1	2	3
4 (a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5 (d)	I found it difficult to work up the initiative to do things	0	1	2	3
6 (s)	I tended to over-react to situations	0	1	2	3
7 (a)	I experienced trembling (e.g. in the hands)	0	1	2	3
8 (s)	I felt that I was using a lot of nervous energy	0	1	2	3
9 (a)	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10 (d)	I felt that I had nothing to look forward to	0	1	2	3
11 (s)	I found myself getting agitated	0	1	2	3
12 (s)	I found it difficult to relax	0	1	2	3
13 (d)	I felt down-hearted and blue	0	1	2	3
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15 (a)	I felt I was close to panic	0	1	2	3
16 (d)	I was unable to become enthusiastic about anything	0	1	2	3
17 (d)	I felt I wasn't worth much as a person	0	1	2	3
18 (s)	I felt that I was rather touchy	0	1	2	3
19 (a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20 (a)	I felt scared without any good reason	0	1	2	3
21 (d)	I felt that life was meaningless	0	1	2	3

Poster