Acceptance and Commitment Therapy for Public Speaking Anxiety - A Case Series Study of Effects on Self-reported, Implicit, Imaginal, and In-vivo Outcomes

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Acceptance and Commitment Therapy for Public Speaking Anxiety - A Case Series Study of Effects on Self-reported, Implicit, Imaginal, and In-vivo Outcomes

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Thesis Abstract

Public speaking anxiety (PSA) is a common problem, and in some cases can lead to significant social and occupational difficulties. While exposure therapy combined with cognitive restructuring is currently the most effective treatment available, approximately 25% of individuals fail to respond.

Acceptance and Commitment Therapy (ACT), a third-wave behavioural approach predicated on supposed different mechanisms of change, may have additional benefits to more traditional interventions, and may be more acceptable to those individuals with PSA who find exposure based therapy too difficult.

A multiple single-case design was used to examine the effects of a self-help ACT intervention for PSA on self-reported, implicit, imaginal, and in-vivo outcomes, across six replications.

All participants reported a reduction in speech anxiety, with evidence of reliable change in three cases. The four participants who reported an increase in willingness to approach a feared public speaking scenario, also completed an in-vivo voluntary speech task. Triangulation of quantitative (daily and weekly measures) and qualitative data (change-interview) indicate that mindfulness (self-as-context and present-moment awareness) may be a key mechanism of change in ACT for individuals with PSA.

The findings offer support for ACT delivered in a self-help format to treat speech anxiety, however, further research is needed to generalise these findings and examine the long term effects.

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Finally, the greatest thanks must go to my wife, Sarah Priestley. Thank you for your patience, understanding, and love. This thesis is dedicated to you.

Statement of Contribution

Journal article and extended paper

- Project design: Dr Nima Moghaddam, Dr David Dawson and Joe Priestley
- Applying for ethical approval: Joe Priestley
- Recruiting Participants: Joe Priestley
- Data collection: Joe Priestley. Creation of internet-accessible measures supported by Dr Nima Moghaddam and Dr David Dawson
- Creation of the Daily ACT measure (of Psychological Flexibility): Joe Priestley, Lauren Roche, Mary Jinks, Dr David Dawson and Dr Nima Moghaddam
- Scoring Measures: Joe Priestley
- Conducting the change interviews: Mary Jinks and Lauren Roche
- Treatment fidelity checks: Mary Jinks and Lauren Roche
- Data entry: Joe Priestley
- Data analysis: Joe Priestley (supervised by Dr Nima Moghaddam and Dr David Dawson)
- Write-up: Joe Priestley (supervised by Dr Nima Moghaddam and Dr David Dawson)

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A Systematic Review of the Effectiveness of Psychological Treatments for Public Speaking Anxiety

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ARTICLE INFO	ABSTRACT
Keywords: Public speaking anxiety Social anxiety disorder Treatment Systematic review	Public speaking anxiety is a common problem. A review in 1989 suggested that treatment consisting of exposure, cognitive restructuring and skills training was effective. A systematic review was conducted to investigate the efficacy of treatments currently available in light of developments in psychological therapies and their delivery since the last review. Embase, Medline, PsycINFO, and Web of Science databases were searched. Reliable evidence suggests that exposure-based treatments are most effective in reducing speech anxiety. Technological advancements allow this form of therapy to be delivered using a virtual audience that can be accessed in the client's home or by using head-mounted equipment with therapist support. Other developing therapies show promise, however more rigorous research is required to determine their effects reliably. The implications of these findings and directions for future research are discussed.

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1.   Introduction

1.1 Public Speaking Anxiety: Impact and Theory

Fear of public speaking, often referred to as public speaking anxiety (PSA), is the anxiety experienced when talking or preparing to talk in front of others. PSA is the most common form of social phobia[1], with prevalence rates thought to be as high as 85% in the general population.[2] In some cases, the level of anxiety associated with speaking in public can result in a reduced chance of continued education, work-related distress or unemployment.[3] Unfortunately, many of those who experience PSA do not seek treatment,[4] possibly due to feelings of shame or embarrassment, or simply because of the nature of the disorder. If left untreated, social phobias such as PSA generally become chronic.[5]

The *Diagnostic and Statistical Manual of Mental Disorders IV*[6] allows clinicians to separate clinical presentations of social anxiety disorder (SAD) into *generalised* or *non-generalised* type; PSA is classed as a non-generalised SAD when restricted to the single domain of public speaking, or generalised SAD if it is part of a wider phobia related to social situations.

There are a number of common theories for the occurrence of PSA. These theories have influenced the development of treatments for those willing to access them.

- The cognitive perspective links the fear caused by public speaking to the thoughts the individual has about his or her inability to perform, an attentional bias towards somatic responses and the likelihood of receiving negative evaluation from others.[7,8] Treatment grounded in this perspective therefore seeks to modify the thoughts associated with public speaking to alleviate the distress.

- Behavioural understanding, grounded in learning theory, suggests that an individual develops a phobia related to speaking in public because they associate the context with aversive consequences.[9] Treatment involves learning that public speaking is not aversive by remaining in the feared situation until anxiety reduces (exposure/habituation).

- Another perspective suggests an individual experiences apprehension when delivering a speech because he or she does not possess the requisite skills.[10] Treatment from this perspective focuses on developing these skills.

1.2 Effective Treatments

In a meta-analysis of the effectiveness of treatments to reduce PSA, Allen et al.[11] suggested that PSA interventions could be categorised as either cognitive modification, exposure, or skills training (reflecting the three theoretical models outlined above). These authors concluded that all treatments resulted in a reduction in PSA, but that the most efficacious form of treatment included all three elements.

Although the conclusions could be used to inform clinician treatments for PSA, this meta-analysis did not provide definitive support for one treatment rather than another. The authors suggested that their conclusions reflected the use of outcome measures that lacked the specificity to accurately measure the construct of PSA and advised that more refined scales should be used in the future. This review was also limited to interpreting self-reported outcome data, precluding analysis of behavioural measurements and clinician ratings, which may prove useful in understanding how treatments affect an individual's ability to deliver a speech. The effects of demand characteristics (e.g. responding to

therapist expectations) mean that self-reported data alone can be unreliable,[12] and may not provide a good indication of the success of an intervention. The authors of this review did not comment on the methodological rigour of the studies included, other than to say that the typical sample size was small; it is therefore difficult to gauge how much confidence one should have in the reliability of their conclusions.

Although subsequent evidence suggested that exposure treatment combined with cognitive restructuring could be effective in treating social anxiety disorders such as PSA[13], this form of therapy is not effective for around a quarter of those who receive treatment.[14] This could be due to the distress elicited during exposure therapy, and the resulting inability of some patients to remain in the aversive situation for long enough for habituation to take place, with the consequence that their negative associations involving public speaking are not reduced.

Since the previous review of treatments for PSA,[11] a number of more accurate measures of PSA (e.g. the Self-Statements during Public Speaking-SSPS[15]) and new therapies have been developed (e.g. Acceptance and Commitment Therapy[16]). Technological advancements have also changed the way in which therapy is delivered (e.g. Virtual Reality Exposure[17]).

1.3   Rationale and Aims

It is 25 years since a systematic review of the effectiveness of psychological treatments for PSA was conducted. Forms of therapy, outcome measures, and the methods by which therapy is delivered have altered, so an update review of the evidence to determine whether Allen and colleagues[11] recommendations are still valid or whether there are now other, better treatment options for those seeking support for PSA seemed timely. Although new treatments may well be categorised according to Allen et al.'s[11] broad treatment types, there may also have been innovations in technology and delivery which may improve access to such therapies. This review seeks to provide a comprehensive synthesis of knowledge about the most effective treatments for PSA, and is based on the research conducted since the previous review. Reviews of this type are an important means of informing clinicians treating PSA about the most effective therapies available. A greater understanding of effective treatment options may improve treatment of patients who find traditional methods of exposure-based therapy ineffective.

The aims of this systematic review were:

- To synthesise the findings from research on psychological treatments for PSA conducted since the previous review.[11]

- To determine the most effective psychological treatments for PSA and the most effective methods of delivering these treatments.

- To assess the quality of studies to determine how much confidence can be placed in their findings.

A secondary aim was:

- To examine whether self-report and observational measures of PSA are concordant in their responsiveness to treatment.

2. Method

2.1 Search and Screening Procedures

Evidence for the effectiveness of psychological treatments for PSA was assessed by conducting a systematic review of the research evidence. The Embase, Medline, PsycINFO, and Web of Science databases were searched electronically for literature published between January 1987 and June 2014. The start date was chosen so that relevant research was captured that might not have been published when the previous review was produced.[11] A list of keywords was created to retrieve relevant articles from these databases. Keywords covered the concepts of anxiety, public speaking, psychological intervention and outcome measurement.

The databases were searched with the following terms on the 14th June 2014:

1.anxiety; 2.anxious; 3.fear; 4.phobia; 5.fright; 6.speech; 7.speak; 8.speaking; 9.talk; 10.public; 11.therap*; 12.intervention* 13.training; 14.psycho*; 15.treatment; 16.outcome; 17.measure; 18.report.

Terms not relevant to the review were removed from the search using the Boolean operator NOT. These were; 1.Mute; 2.stut*; 3.children; 4.depress*.

The titles and abstracts retrieved in this initial search were assessed by the research team using the inclusion and exclusion criteria below. The full texts of potentially eligible studies were retrieved. Full text articles were again reviewed against the inclusion and exclusion criteria and a final set of articles was chosen for inclusion in the review. Hand searching revealed additional relevant articles which were then included in the review.

2.2 Inclusion Criteria

1.) Articles that had been peer reviewed.
2.) Studies that used an adult sample (18 years or above).
3.) Studies that compared at least one psychological treatment of PSA to a passive control (e.g. no treatment, waiting list).
4.) Studies using at least one outcome measure designed to identify reduction of PSA.

5.) Studies including participants who were screened to confirm they had PSA.

6.) Articles in English.

Only peer reviewed journal articles were included to ensure minimum levels of quality and credibility in the articles reviewed. The review was limited to the treatment of adults with PSA and therefore excluded studies with a sample including children or adolescents; factors such as developmental stage and the impact of education may be relevant to treatment of this population and the subject therefore deserves an exclusive investigation.

The criteria also stipulated research comparing at least one form of psychological therapy with a passive control group (a group receiving no treatment). Use of a control group enables the effect of an intervention to be calculated in comparison to the effects of receiving no treatment at all and allows more robust conclusions about treatment effectiveness to be drawn. Use of control groups is one method of assessing possible threats to internal validity (such as the effects of history and/or maturation), for example, if a reduction in PSA is found in a waiting list control group at the post-intervention assessment, then one must assume that changes in the other groups may have been due to factors other than the psychological treatment.

Mohr[18] suggested that new treatments should first be compared to 'doing nothing at all' (no-treatment or waiting list); only if they pass this preliminary test of efficacy is it worth comparing them to 'treatment as usual' or alternative treatment groups. As this review seeks to investigate the effects of new treatments and methods of treatment delivery, it is important to establish their effectiveness relative to a passive control group as a first step.

The American Psychological Association's definition of a 'psychological therapy'[19] was used to decide whether an intervention was eligible for inclusion. This criterion ensured that only studies measuring PSA were included. The criteria also required that participants should have a minimum level of PSA, determined by a structured interview and/or a relevant measure. This ensured that samples in reviewed studies were representative of the population of adults with PSA, and enabled the aims of the current review to be addressed.

2.3   Exclusion Criteria

- Studies using participants engaged in public speaking/communication classes.

This exclusion criterion was applied because (a) such a sample is unlikely to be representative of the broader PSA population and (b) it is difficult to separate the effects of an experimental intervention from the confounding variables present in the context of a class designed to reduce PSA.

2.4   Eligible Studies

Electronic searches identified 1,569 citations once duplicate records were removed. The titles and abstracts were assessed for their relevance to the review (stage 1 screening), resulting in a set of 33 potentially eligible publications. Three additional papers were identified through hand searches. Full texts of all these publications were obtained. Inclusion and exclusion criteria were applied to the full texts of these 36 publications (stage 2 screening), resulting in the exclusion of 26 papers. A set of 10 publications were included in the systematic review (Figure 1).
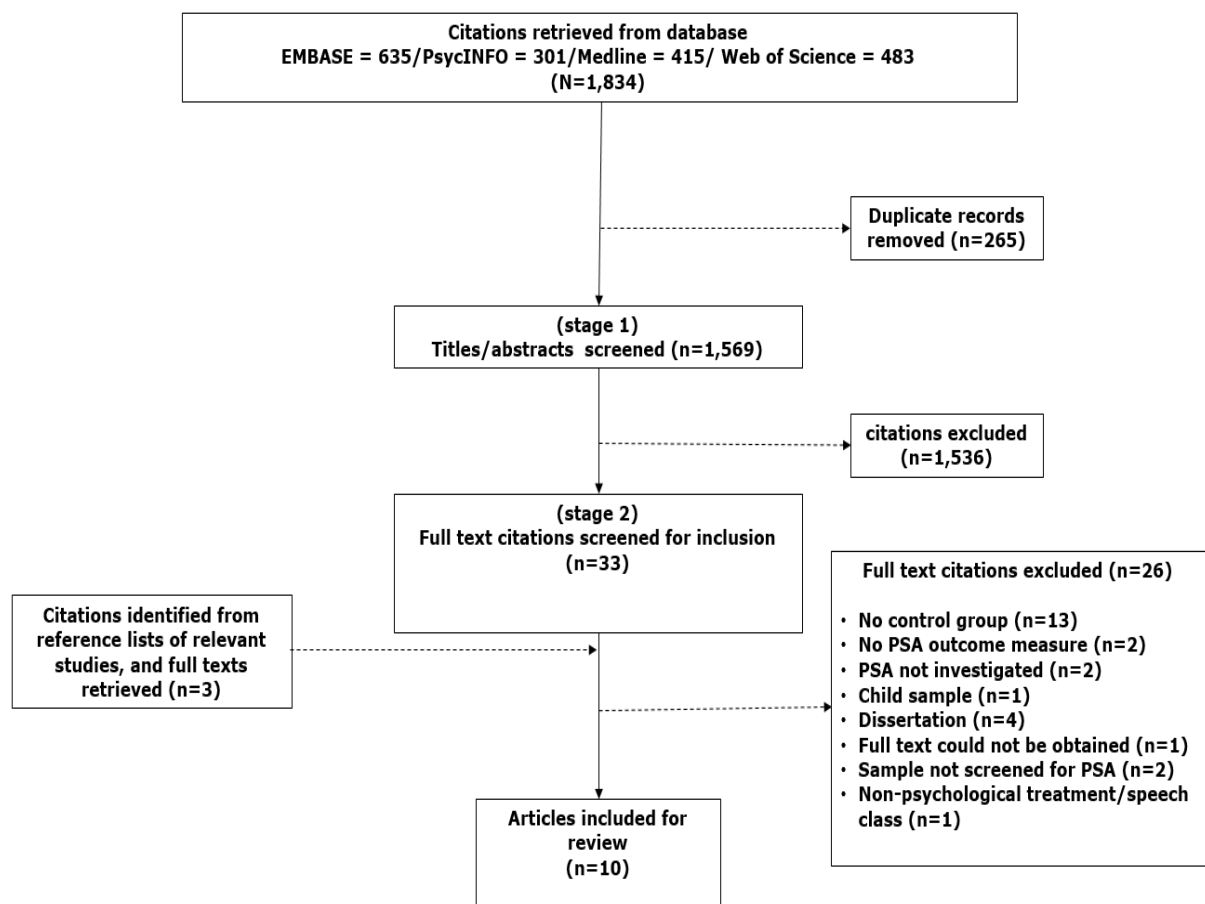
Figure 1. QUORUM Diagram Outlining the Search and Screening Process

2.5 Data Extraction, Quality Rating, and Synthesis

A data extraction sheet was created to record the author(s), publication date, characteristics of the sample, country of origin, design, type of control, group allocation procedure, treatment(s) investigated and the duration of treatment for all included studies.

The outcomes of interest extracted were:

- Change in self-report measures of PSA.
- Change in clinician rating/behavioural measures of PSA.
- Whether the effects of treatment remained at follow-up.
- Whether the experimental treatment group improved relative to the control group.
- Whether the experimental treatment group improved relative to alternative treatment groups.

Effect sizes (ESs) were calculated as Cohen's d[20] and recorded for each condition in the reviewed studies. The ES provides a measure of the magnitude of difference between groups, and demonstrates the difference in outcomes between groups, in this case experimental treatment groups, no-treatment control group and sometimes alternative treatment groups. As a general rule of thumb Cohen[20] suggested:

- 0.2 represents a small effect
- 0.5 a moderate effect
- 0.8 or above, a large effect

As not all the studies reviewed reported sufficient data to enable ESs to be calculated, a narrative synthesis approach was adopted.

The psychotherapy outcome study methodology rating form (POMRF[21]) was used to assess the quality of the reviewed studies. This 22-item scale assesses methodological elements such as whether therapists were adequately trained and whether power analysis was conducted. As this review included studies with a passive control group, question 22, 'Equality of therapy hours - for non-waitlist control designs only' was omitted. The maximum score on this adapted scale was 42. A high score indicates rigorous methodology. The POMRF was chosen to assess the quality of the research as it possess good psychometric properties, including good internal consistency and good inter-rater reliability (.86 and .75 respectively[21]).

3.   Results

3.1   Overview

Ten studies were included in the review (Table 1). The most common form of treatment examined was Virtual Reality Exposure therapy (VRE; n=4), followed by Internet-delivered Cognitive Behavioural Therapy (ICBT; n=2). Other forms of treatment investigated were Acceptance and Commitment Therapy (ACT; n=1), Communication-Orientation Motivation therapy (COM; n=1), Eye Movement Desensitisation and Reprocessing (EMDR; n=1), and enhancement of Cognitive Behavioural Therapy (CBT) with hypnosis (CBT-H; n=1).

3.2   Sample

Sample sizes ranged from 11[22] to 136[23], with an average sample size of 68.3. The mean age of participant ranged from 19.4 to 40.31. A high proportion of the studies recruited university students (70%). On average samples were 70.8% female, indicating a gender bias. The majority of the studies took place in the United States of America (70%).

3.3   Study Design

Waiting list groups were the most common form of control (n=9), with one study using a no-treatment control group. CBT was the most commonly used alternative active treatment (n=4). Seven studies employed a randomised controlled trial (RCT) design; the rest used another between-groups design. The average treatment period was just under six weeks (5.8 weeks).

Table 1

Reviewed Studies by Intervention Type

Study	N	Age	M age	% female	Population	Country	Design	Ctrl	Ran/al	Intervention	Length
ACT											
Block et al. [22]	11	-	-	63.6	U	USA	BG	WLC	N	ACT vs. CBT	4 wks
COM											
Ayres et al. [23]	136	18-52	19.4	-	U	USA	RCT	WLC	Y	COM vs. SD	1 wk
EMDR											
Foley et al. [24]	40	-	-	77.5	U	USA	RCT	NTC	Y	EMDR	2 sessions
ICBT											
Gallego et al. [25]	41	19-57	39.29	68.3	C	Holland	RCT	WLC	Y	ICBT	6 wks
Botella et al. [26]	127	18-84	24.4	79.2	U/C	Spain	RCT	WLC	Y	ICBT vs. CBT	8 wks
CBT-H											
Shoenberger et al [27]	62	18-56	-	67.7	U/CT	USA	RCT	WLC	Y	CBT-H vs. CBT	5 wks
VRE											
Harris et al. [28]	14	-	-	-	U	USA	BG	WLC	N	VRE	4 wks
Wallach et al. [29]	88	-	27	79	U	Israel	BG	WLC	N	VRE vs. CBT	12 wks
Anderson et al. [30]	97	19-69	39.03	62	C	USA	RCT	WLC	Y	VRE vs. EGT	8 wks
Price et al. [31]	67	-	40.31	69	C	USA	RCT	WLC	Y	VRE vs. EGT	8 wks

Notes. Number of participants: N; Mean age: M age; Percentage female: % female; Clinical: C; University: U; Community: CT; Randomised controlled trial: RCT; Other between-groups: BG; Control type: Ctrl; Waiting list control: WLC; No treatment control: NTC; Random allocation: Ran/al; Acceptance and commitment therapy: ACT; Exposure group therapy: EGT; Cognitive behavioural therapy with hypnosis: CBT-H; Communication-Orientation motivation therapy: COM; Eye movement desensitisation and reprocessing: EMDR; Internet-delivered cognitive behavioural therapy: ICBT; Virtual reality exposure therapy: VRE.

3.4   Outcome Measures and Assessment Tools

All studies used self-report measures to assess change in PSA over time (Figure 2).

Note: Personal report of communication apprehension (PRCA); Willingness to communicate scale (WTC); Personal report of confidence as a Speaker (PRCS); Public speaking Self-efficacy Questionnaire (PSSEQ); Self-statements during public speaking (SSPS); Fear public speaking questionnaire (FPSQ); Personal report of public speaking anxiety (PRPSA); Fear of negative evaluation (FNE).

Figure 2. *Frequency of measures used in the reviewed studies*

Within the reviewed studies the self-report measures demonstrated good internal consistency (.69-.94) and test-retest reliability (.78-.94) suggesting that scales used were sufficiently reliable to capture reductions in self-reported PSA. Clinician ratings and behavioural measures were less commonly used (n=4).[24–26,30]

3.5 Assessment of Quality

The POMRF was used to assess the methodological rigour of the studies (Table 2). The maximum score that could be obtained on this adapted scale was 42, indicating the highest possible methodological quality. The lowest score possible was 0, indicating the lowest possible methodological quality. Table 2 displays the quality scores achieved by the studies. The range of POMRF scores was large, from 5 to 29, with a mean score of 15.20 across the 10 studies. Following Swain et al.[32] the standard deviation (7.77) was used to calculate thresholds for categorising the studies according to methodological quality. Studies that scored one SD (rounded to the nearest whole number) below the mean were rated as 'well below average' (0-7), within one SD of the mean rated as 'below average' (8-15), then 'above average' (16-24) and 'well above average' (25 – 42).

Two studies were classed as 'well below average' and three studies as 'below average'. Only one study was rated 'well above average', with the remaining four rated 'above average'. A recent meta-analysis investigating CBT treatment for anxiety disorders reported an average POMRF score of 27.8,[21] which suggests the quality of the studies in the current review was low in comparison to research into anxiety disorders more generally.

Table 2
POMRF Score and Outcome of Reviewed Studies by Intervention Type

Study	N	POMRF score	POMRF rating	Outcome	ES vs. control (SR)	ES vs. alt treat (SR)	ES vs. control (CR)	ES vs. alt treat (CR)
ACT								
Block et al.[22]	11	8	Below average	↓ SR, ACT = CBT > WLC. [a]	-	-	-	-
COM								
Ayres et al.[23]	136	7	Well below average	↓ SR, COM = SD > WLC & placebo (exc. WTC)	COM>WLC 0.52	COM>SD 0.28	-	-
EMDR								
Foley et al.[24]	40	11	Below average	↓ SR, EMDR = MS/RE >NTC (exc. SUDS & VOC), EMDR/MS/RE = NTC on BASA & HR - ns. [b]	-	-	-	-
ICBT								
Gallego et al.[25]	41	16	Above average	↓SR, ICBT>WLC, at post 30.8% ≠ diagnosis on ADIS-IV.	ICBT>WLC 0.86	-	ICBT>WLC 0.58	-
Botella et al.[26]	127	22	Above average	↓SR ↓ CR, ICBT=CBT >WLC, at post-60%/FU-55% ≠ diagnosis on ADIS-IV.	ICBT>WLC 0.35-1.17	CBT>ICBT 0.03-0.33	ICBT>WLC 1.39	CBT>ICBT 0.26
CBT-H								
Schoenberger et al.[27]	62	13	Below average	↓ SR, ↓ CR, CBT-H = CBT > WLC.	CBT-H>WLC 1.64	CBT-H>CBT 0.51	CBT-H>WLC 1.17	CBT-H>CBT 0.70
VRE								
Harris et al.[28]	14	5	Well below average	↓SR, VRE >WLC on PRCS. All other outcomes ns.	VRE>WLC 1.79	-	-	-
Wallach et al.[29]	88	22	Above average	↓ SR, VRE = CBT > WLC (exc. FNE). CR = VRE & CBT=WLC ns.	VRE>WLC 0.70	CBT>VRE 0.18	VRE>WLC 0.1	CBT>VRE 0.06
Anderson et al.[30]	97	29	Well above average	↓ SR at post and FU (exc - FNE), VRE = EGT >WLC, FU = 25% ≠ diagnosis on SCID.	VRE>WLC 1.44	EGT>VRE 0.70	VRE>WLC 0.85	EGT>VRE 0.18
Price et al.[31]	67	19	Above average	↓SR, VRE = EGT (SSPS & PRCA). [c]	-	VRE>EGT 0.24-0.63	-	-

Notes: Psychotherapy outcome methodology rating form: POMRF; Outcome – Acceptance and commitment therapy: ACT; Anxiety disorders interview schedule 4: ADIS-IV; Clinician Rated: CR; Behavioural assessment of speech anxiety: BASA; Cognitive behavioural therapy: CBT; Cognitive behavioural hypnotic therapy: CBT-H; Communication orientation motivation therapy: COM; Effect size: ES; Eye movement desensitisation & reprocessing: EMDR; Excluding: exc.; Exposure group therapy: EGT; Fear of negative evaluation: FNE; Follow-up: FU; Heart rate: HR; Internet CBT: ICBT; Moving sound: MS; Not significant: ns.; No treatment control: NTC; Personal report of communication apprehension: PRCA; Personal report of confidence as a speaker: PRCS; Resting eyes: RE; Self-report: SR; Self-statements during public speaking: SSPS; Structured clinical interview for the DSM-IV: SCID; Subjective units of distress: SUDS; Systematic desensitisation: SD; Validity of cognition: VOC; Virtual reality exposure: VRE; Wait list control: WLC; Willingness to communicate scale: WTC.

a Authors did not report descriptive statistics or conduct statistical analysis. ES could not be obtained. b ESs were not calculable from the data provided. c Authors did not provide information on the control group's post intervention scores, so not ES comparison between VRE and the control group could be calculated.

The methodological quality of the studies was varied. Only two studies blinded the therapist to the treatment condition.[27,30] Therapist allegiance to the treatment under investigation may have biased the results reviewed here in favour of the experimental treatments. Checks for therapist competence and adherence to treatment protocols were completed in only two studies.[30,31] This is not necessarily a reflection of poor methodology; because many of the treatments investigated were in their infancy there may have been no standard treatment protocol in many cases.

Reflecting the inclusion criteria, the studies used good outcome measurement methods and recruited representative samples (n=10). Eight studies also used an alternative treatment group.

3.6   Outcomes

Table 2 displays the outcome of each study grouped by type of treatment. All treatments produced a reduction in PSA, so it was important to synthesise these findings in order draw conclusions about their relative effectiveness on the basis of factors such as ES and the methodological quality of the studies of the treatment.

3.7   Virtual Reality Exposure (VRE)

The most common form of treatment investigated was VRE (n=4). VRE involves the client wearing head-mounted equipment to immerse him or herself in a virtual public speaking environment. The therapist can then manipulate the audience in a controlled manner to provide different exposure environments (e.g. an angry audience).

All studies investigating VRE reported a large reduction in self-reported PSA compared to control conditions (d=0.70-1.79). In a study with significant methodological weaknesses, Harris et al.[28] assigned a small group of university students to a VRE group (n=8) or a waiting list control (WLC) group (n=6). Participants in the VRE group showed a significant improvement on a self-reported measure of PSA compared to the control group after four weeks of treatment (d=1.79). All other self-reported and physiological measures (e.g. heart rate) were similar in the two groups after the intervention. The low POMRF score (5) for this study reflects the small sample size, failure to allocate participants randomly, and use of a control group containing participants who were exposed to public speaking situations during the study and thus received informal exposure treatment which affected their 'control' status.

Although the findings from this study should be treated with caution, more rigorous research has shown VRE to be an effective treatment for

PSA. In three studies comparing VRE with existing evidence-based treatments in the form of CBT[29] or exposure group therapy (EGT),[30,31] VRE was shown to be efficacious in reducing self-rated PSA (d=0.70–1.44). In a study comparing VRE with CBT, Wallach et al.[29] found both treatments were effective in reducing self-reported PSA in comparison with a control condition. Although the CBT group showed a slightly greater reduction in PSA than the VRE group (d=0.18), this difference was trivial showing support for VRE as a treatment option for those with PSA. Although this study was of 'above average' methodological quality, nearly 80% of the sample were female university students, and the average age of participants was 27 years old, so the generalisability of the findings may be limited. Although classed as a RCT, due to early drop-out rates, participants were weighted to the CBT condition, suggesting participants were not truly randomised. Checks for adherence to treatment fidelity were abandoned due to technical failures, suggesting therapists may not have stayed true to their respective treatments. Interestingly, there was no significant difference between the VRE group and the WLC group on the measure of 'fear of negative evaluation'. This finding was replicated in another study of VRE for PSA.[30] This indicates that although VRE may be effective in reducing avoidance of public speaking, it may not reduce the fear of negative appraisals.

A further two RCT studies[30,31] compared the effects of VRE and EGT in treatment of PSA. Both studies reported that VRE produced a significant reduction in PSA; however only Anderson et al.[30] reported data that allowed the effect of treatment to be compared to a WLC group (d=1.44). Price et al.[31] found no significant difference between VRE and EGT in terms of self-reported reduction in PSA, but in this case, the VRE group was slightly more effective (d=0.24-0.63). Price et al.'s study had some important flaws. Although the treatment arms were evenly split, those in the VRE group received individual therapy whereas those in the EGT group received treatment as a group. The findings from this study may reflect the different effectiveness of individual and group therapy for PSA, rather than the difference between two treatment types.

In an attempt to improve the methodological rigour of research in this area, Anderson et al.[30] measured the initial and long-term effects of VRE on PSA. The results were promising and post-intervention data on behavioural measures (d=0.18) and self-reported measures of speech anxiety (d=0.70) suggested that VRE was a more effective treatment for PSA than EGT. Although there was no significant group difference in

speech performance, those in the VRE group spoke longer and reported less anxiety than the WLC group. Treatment gains remained at follow-up for both VRE and EGT groups. Again, however, those in the VRE group received individual therapy, and may therefore have received a 'higher dose' intervention which may have biased the results in favour of VRE.

3.8   Internet-delivered CBT (ICBT)

ICBT was the second most commonly studied treatment for PSA in this review. Two studies investigated a novel ICBT intervention entitled 'talk to me'. This self-help internet-based programme uses education, exposure and cognitive re-structuring and is self-administered. Like VRE, the 'talk to me' intervention consists mainly of an exposure element. The patient is required to deliver speeches to an increasingly intimidating audience, until their reported anxiety reduces. In the first RCT to investigate the efficacy of this programme, Botella et al.[26] compared ICBT with therapist-delivered CBT for PSA. Both treatment groups showed a significant reduction in PSA, with the ICBT group improving significantly on self-rated (d=0.35-1.17) and clinician-rated (d=1.39) measures compared with the WLC group. No significant difference was found between the treatment groups, with the effects of treatment slightly favouring therapist delivered CBT (d=0.33). After the intervention, there was no significant difference between the ICBT group and the WLC group on self-rated performance during a speech task. Treatment gains were evident in both treatment groups 12 months after therapy. Similar results were found in a test comparing the same ICBT programme with a WLC group in a study using Dutch participants.[25] In this study self-report measures showed a reduction in PSA in the ICBT group relative to the WLC group (d=0.86) but post-intervention, there was no significant difference in clinician assessments of speech performance. Although these results are promising, the attrition rates in the ICBT conditions were extremely high in both studies (45.8% and 51.6%) suggesting that around half of the samples did not engage in the treatment, or simply did not find it effective. Although both studies received an 'above average' POMRF rating, there seem to be a number of methodological problems which are common in this area of research. Both samples consisted predominantly of well-educated women (68.3% and 79.2%) and there was inconsistent recording of measures in control groups in both these studies. Trials have only been conducted using Spanish and Dutch samples to date.

3.9   Individual Treatment Trials

The current review also encompassed a further four studies investigating other treatments for PSA, namely ACT, COM, EMDR and CBT-H. Table 3 provides a description of these therapies.

Table 3:
Description of Additional Treatments Included in the Current Review

Treatment	Key components
Acceptance and Commitment Therapy (ACT)	ACT encourages acceptance, value driven behaviour and mindfulness strategies to reduce the distress associated with public speaking.
Communication-Orientation Motivation (COM)	COM uses cognitive restructuring methods to shift the clients focus from a performance orientation to a communication/information giving orientation to reduce their anxiety related to public speaking.
Eye Movement Desensitisation and Reprocessing (EMDR)	EMDR assumes that a person's PSA developed because of an aversive public speaking experience. EMDR encourages the client to recall this experience whilst engaging in side to side eye movements that allows this aversive memory to be processed, thus relieving the anxiety associated with public speaking.
Hypnosis-enhanced CBT (CBT-H)	Hypnotic enhancement in CBT involves the therapist labelling the relaxation component of therapy as 'hypnotic' to enhance the effects of treatment by increasing the client's outcome expectancy.

All four of these studies received a POMRF rating of 'below average' or worse (7-13). Common methodological weaknesses were:

- Over-representation of women in the sample (63.6%–77.5%)
- Poorly trained or inexperienced therapists
- Lack of control over concomitant treatments during the study.

The study with the lowest POMRF score (7) of these four, compared COM, systematic desensitisation, a placebo and a WLC group. Ayres et al.[23] found that participants who read a self-help COM book rated their PSA as significantly less than the WLC group and the placebo group (who were instructed to read a book about 'great speeches') after the intervention (d=0.52). There was no significant difference between the COM group and the treatment comparison group, who watched a self-help systematic desensitisation video (d=0.28).[33] None of the groups showed improvement on the 'willingness to communicate' scale indicating that although systematic desensitisation and COM may alter perceived anxiety about public speaking, they may not improve willingness to undertake public speaking.

One therapy thought to encourage willingness to experience anxiety,[34] and therefore willingness to undertake public speaking, is ACT. Only one study in this review investigated ACT as a treatment for PSA. In a study using a small sample of university students (n=11) Block et al.[22] compared ACT with cognitive behavioural group therapy (CBGT) and a WLC group. After four weeks of treatment, participants in the ACT and CBGT groups showed a reduction in anxiety and greater willingness to undertake public speaking relative to the WLC group. However, willingness was measured on an untested index created by the authors and scores may not have reflected the target construct accurately or reliably. No behavioural test was conducted to determine whether the participants would actually be willing to undertake a speech task. Participants in the ACT group were also encouraged to complete exposure exercises throughout the intervention, so exposure may have been an important factor in the changes reported. Owing to the many limitations of this study, only a tentative endorsement of the use of ACT to treat PSA can be given at this stage.

Exposure to the feared stimulus, in this case public speaking, was a common feature of many successful treatment programmes. The importance of exposure was highlighted by a study of EMDR conducted by Foley et al.[24] In this dismantling study, three treatment groups were compared with a no-treatment control group. The treatment groups followed a standard EMDR treatment protocol with eye movements, resting eyes instead of eye movements, or a moving sound stimulus instead of eye movements. The results suggested that all treatment groups displayed a significant reduction in self-rated PSA compared with the no-treatment control group. The relative effectiveness of the different treatments could not be calculated from the data provided but the authors concluded that the exposure element of EMDR was the 'active ingredient'. However, there was no significant difference between the treatment groups and the control group on performance during a

speech task, indicating that the effects of treatment did not lead to an observable change in public speaking behaviour.

Schoenberger et al.[27] demonstrated that CBT treatment for PSA could be enhanced simply by labelling relaxation elements of the treatment as 'hypnosis'. In this study, 62 participants were randomly allocated to a CBT treatment group, a CBT-H group or a WLC group. Following the five week intervention, participants in the CBT-H group showed a significant reduction in self-rated measures of PSA ($d=1.64$), and clinician ratings of performance on a speech task ($d=1.17$) compared with the WLC group. There was no significant difference between treatment groups on either measure; however the effects of the treatment favoured CBT-H compared to CBT ($d=0.51/0.70$). Many participants in the control group did not return for post-intervention assessment (52.4%), resulting in a large proportion of missing post-treatment data for the control group. This may have resulted in an exaggeration of the effects of CBT-H because of the uneven group sizes.

4.   Discussion

This systematic review set out to determine which forms of psychological therapy were effective in treating PSA. The focus was on: (a) literature published in the last 25 years, in order to update findings from a 1989 review[11] and investigate the evidence on recent innovations in therapy for PSA and (b) studies with no-treatment control conditions, in order to control for traditional threats to internal validity and investigate whether novel therapies were superior to no intervention (a minimum standard for evaluation of effectiveness, which is useful when reviewing recent innovations and inchoate evidence[18]). Applying this selection criterion enabled the calculation and comparison of ESs across the studies.

All psychological treatments reviewed were effective in reducing PSA according to self-reports. All therapies except EMDR were found to be similar in effectiveness to treatments suggested to reduce PSA in the previous review.[11] A comparison of ESs indicated that exposure-based treatments (VRE) were most effective in reducing self-reported PSA, followed by treatments combining exposure with cognitive restructuring (CBT-H; ICBT) and then treatments using cognitive restructuring only (COM). All treatments also included elements of psycho-education or skills training, suggesting this may be an important contributor to their effects. ESs for studies of ACT and EMDR could not be calculated from the data available in the publications; therefore, conclusions about these treatments are limited.

Like the earlier review by Allen et al,[11] treatments for PSA fell into the broad treatment categories reflecting common psychological theories of PSA (behavioural exposure/habituation based accounts, cognitive appraisal-based accounts and skills deficit-based accounts). Moreover, the average effect of the treatments investigated in the current review (*d=1.06)* was similar to the average effects of treatments (using within group comparisons) investigated in the previous review (*d=1.19)*. However, changes in how these treatments are delivered, utilising technological innovations or methods to encourage people to engage in exposure may benefit patients who are too anxious or embarrassed to seek face-to-face treatment,[4] or find traditional in-vivo exposure too anxiety provoking, and therefore ineffective.[14]

Although all treatments produced reductions in self-rated PSA, some produced no improvements relative to a no-treatment control group on measures of speech performance,[24,25,29] or fear of negative evaluation.[26,29,30] This indicates that although psychological treatments for PSA may increase ability to undertake public speaking, they may not improve speech performance or reduce fearful cognitions associated with being evaluated. These findings could, however, reflect the fact that the majority of the treatments reviewed were exposure-based and produced outcomes consistent with the theoretical foundation for exposure therapies, namely they reduced anxiety associated with the stimulus - in this case public speaking situations - but did not alter cognitions or necessarily improve performance.

4.1 Limitations of the Included Studies

Although the results reviewed here are encouraging and offer evidence for the effectiveness of a number of therapies in reducing PSA, the methodological quality of the studies was generally poor. All the studies used predominantly female samples. University students were also commonly used. Although every study ensured that participants had a minimum level of PSA prior to treatment, the average sample size in the reviewed studies was low. In view of these limitations the generalisability of the findings is limited. More rigorous research is needed before the majority of these treatments can be recommended with confidence. Nevertheless, the quality of research in the areas of VRE and ICBT is encouraging, which gives confidence in the reliability of these findings, and therefore these therapies as suitable for treating PSA.

Of the studies that conducted follow-up investigations, only one measured speech performance. Therefore, little is known about the long

term impact of psychological treatment on behavioural change, and whether speech performance improves over time.

4.2   Evaluation of the Review

The search strategy provided comprehensive coverage of the field and resulted in retrieval of a large number of potentially relevant studies. Inclusion and exclusion criteria were applied and this reduced the number of studies considered to 10. Only peer-reviewed publications reporting studies that used appropriate psychometric measures, passive control groups and participants with a confirmed minimum level of PSA were included. This produced a reasonably parallel set of studies for review, which allowed for descriptive comparisons of effect sizes; nonetheless, the heterogeneity of studies (e.g., variability in terms of intervention model, length of treatment, and allocation to groups) precluded meaningful use of formal meta-analysis. The methodological quality of the reviewed publications was assessed to inform the comparative analysis and estimate the reliability of the findings.

The review was subject to a number of limitations which may have influenced the findings. The decision to include only peer-reviewed articles may have resulted in exclusion of relevant data from grey literature. The sample of studies selected for review may have been affected by publication bias, insofar as they may have been published because they reported positive findings. This might explain why all the therapies investigated produced a reduction in PSA. Inclusion of grey literature might have extended the evidence base and allowed more definite conclusions to be made about which forms of psychological treatment are most effective, rather than making the general assertion that there was some evidence to suggest that all the psychological treatments reviewed were effective in treating PSA.

The POMRF was useful in determining the reliability of the reviewed studies. Although the average POMRF score for the sample indicated that the methodological quality of the studies was generally poor, these ratings may reflect failure to report that certain procedures were followed rather than failure to follow them. Adhering to journal word limits may make it difficult to provide a comprehensive report of methods used. The standard of research in this area may therefore be more rigorous than is indicated by the POMRF scores. It is also important to bear in mind that this review considered treatments in the early stages of development. The POMRF scores may therefore reflect the fact that some of the studies reviewed were pilot studies or RCTs

conducted to demonstrate a treatment effect to warrant further, more rigorous investigation.

5.   Conclusion

A systematic review of psychological interventions for the treatment of PSA, focusing on studies published after 1987, employing no-treatment control groups was presented. Many of the studies in this field have methodological shortcomings; the most reliable evidence of effectiveness was found for psychological interventions focusing on exposure as these studies were the most rigorous. It has been demonstrated that exposure treatment for PSA is effective when delivered via the Internet as a self-help therapy and when exposure is to virtual audiences accessed using head-mounted equipment. Although other therapies such as ACT, COM, and EMDR were effective, more rigorous replications of the relevant results is required before they can be confidently recommended as treatments for PSA.

5.1 Implications

These findings have positive implications for individuals who find traditional in vivo exposure too anxiety-provoking, and therefore ineffective.[14] Technological advances mean that exposure-based treatment for PSA can be delivered to a client in his or her home, or administered by a therapist in a controlled manner with the aid of virtual reality technology. Although this technology is not widely available at present, the cost is relatively low.[29] Services should therefore consider how technological innovations could improve accessibility and usability of exposure-based therapies for populations who have previously found this form of therapy unsuccessful or difficult to access. There is evidence that individuals with PSA and other SAD-related difficulties may be deterred from seeking treatment if this requires clinic attendance,[4] so self-help interventions delivered over the Internet may be considered as a method of making early interventions accessible to individuals who may be at risk of developing more general social phobia if left untreated.

5.2 Future Research

Although the results of this review show promise for alternative treatments delivered in innovative ways, it must be remembered that this review set out to investigate the effect of these treatments when compared to doing nothing. As such, the size of the effects reported may give an inflated impression. As suggested by Mohr,[18] now initial efficacy has been demonstrated (stage 1), future studies should continue to compare interventions directly (stage 2), particularly looking

at how virtual or other methods compare with previously established 'gold standard' treatments (exposure combined with cognitive restructuring). Although some studies have begun to do this, future investigations should address the methodological limitations of current research in this area. Studies should use a representative, gender-balanced sample and a design which is sufficiently powerful to detect effects of the expected size. Therapies should be delivered by appropriately trained clinicians and compliance with treatment protocols should be verified; therapists should be blind to the experimental condition. Further investigations should focus on the relationship between self-report and behavioural measures of PSA; re-administration of behavioural measures at follow-up would enable a better understanding of the long-term effects of psychological treatments on speech performance.

Acknowledgements

References

1. Ruscio AM, Brown TA, Chiu WT, Sareen J, Stein MB, Kessler RC. Social fears and social phobia in the USA: Results from the national comorbidity survey replication. *Psychological Medicine*. 2008;38:15–28.

2. Motley MT. *Overcoming your fear of public speaking: A proven method.* Boston: Houghton Mifflin; 1997.

3. Aderka IM, Hofmann SG, Nickerson A, Hermesh H, Gilboa-Schechtman E, Marom S. Functional impairment in social anxiety disorder. *Journal of Anxiety Disorders*. 2012;26:393-400.

4. Bebbington PE, Meltzer H, Brugha TS, Farrell M, Jenkins R, Ceresa C, et al. Unequal access and unmet need: Neurotic disorders and the use of primary care services. *Psychological Medecine.* 2000;30:1359–1367.

5. Craske MG. *Anxiety disorders: Psychological approaches to theory and treatment.* New York: Basic Books; 1999.

6. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*: DSM 4. Washington: American Psychiatric Association; 1994.

7. Meichenbaum D. *stress inoculation training*. New York: Pergamon; 1985.

8. Clark DM, Wells A. A cognitive model of social phobia. In: Heimberg RG, Liebowitz MR, Hope DA, Schneirer FR (eds.) *Social phobia diagnosis, assessment, Treatment*. New York: Guilford Press; 1995. p69-93.

9. Marshall WL, Parker L, Hayes BJ. Treating public speaking problems: A study using flooding and the elements of skills training. *Behaviour Modification*. 1982;6:147–170.

10. Fremouw WJ, Zitter R. A comparison of skills training and cognitive restructuring-relaxation for the treatment of speech anxiety. *Behaviour Therapy*. 1978;9:248–259.

11. Allen M, Hunter JE, Donohue WA. Meta-analysis of self-report data on the effectiveness of public speaking anxiety treatment techniques. *Communication Education*. 1989;38:54–76.

12. De Jong PJ, Pasman W, Kindt M, Van Den Hout MA. A reaction time paradigm to assess (implicit) complaint-specific dysfunctional beliefs. *Behaviour Research and Therapy*. 2001;39:101–113.

13. Gould RA, Buckminster S, Pollack MH, Otto MW, Massachusetts LY. Cognitive-behavioral and pharmacological treatment for social phobia: A meta-analysis. *Clinical Psycholology: Science and practice.* 1997;4:291–306.

14. Dalrymple KL, Herbert JD. Acceptance and commitment therapy for generalized social anxiety disorder: A pilot study. *Behaviour Modification*. 2007;31:543–568.

15. Hofmann SG, Dibartolo PM. An instrument to assess self-statements during public speaking: Scale development and preliminary psychometric properties. *Behaviour Therapy*. 2000;31:499–515.

16. Hayes SC, Strosahl KD, Wilson KG. *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford Press; 1999.

17. Parsons TD, Rizzo AA. Affective outcomes of virtual reality exposure therapy for anxiety and specific phobias: A meta-analysis. *Behaviour Therapy and Experimental Psychiatry.* 2008;39:250–261.

18. Mohr DC, Spring B, Freedland KE, Beckner V, Arean P, Hollon SD, et al. The selection and design of control conditions for randomized controlled trials of psychological interventions. *Psychotherapy and Psychosomatics*. 2009;78:275–284.

19. American Psychological Effectiveness. APA: *Recognition of psychotherapy effectiveness.* http://www.apa.org/about/policy/resolution-psychotherapy.aspx (accessed 21 June 2014).

20. Cohen J. *Statistical power analysis for the behavioral sciences*. 2nd ed. Hillsdale, New Jersey: Lawrence Earlbaum Associates; 1988.

21. Ost L-G. Efficacy of the third wave of behavioral therapies: A systematic review and meta-analysis. *Behaviour Research and Therapy*. 2008;46:296–321.

22. Block JA, Wulfert E. Acceptance or change: Treating socially anxious college students with ACT or CBGT. *Behaviour Analyst Today*. 2000;1:1–55.

23. Ayres J, Hopf T, Peterson E. A test of communication-orientation motivation (COM) therapy. *Communication Reports*. 2000;13:35–44.

24. Foley T, Spates CR. Eye movement desensitization of public-speaking anxiety: a partial dismantling. *Journal of behavior therapy and experimental psychiatry*. 1995;26:321–329.

25. Gallego, M J, Emmelkamp, P, M G, Van der Kooij M, Mees H. The effects of a Dutch version of an internet-based treatment program for fear of public speaking : A controlled study. *International journal of clinical health psychology*. 2011;11:459–472.

26. Botella C, Gallego MJ, Garcia-Palacios A, Guillen V, Baños RM, Quero S, et al. An internet-based self-help treatment for fear of public speaking: a controlled trial. *Cyberpsychology, Behaviour and Social Networking*. 2010;13:407–421.

27. Schoenberger NE, Kirsch I, Gearan P, Montgomery G, Pastyrnak SL. Hypnotic enhancement of a cognitive behavioral treatment for public speaking anxiety. *Behaviour Therapy*. 1997;28:127–140.

28. Harris SR, Kemmerling RL, North MM. Brief virtual reality therapy for public speaking anxiety. *Cyberpsychology and Behaviour.* 2002;5:543–550.

29. Wallach HS, Safir MP, Bar-Zvi M. Virtual reality cognitive behavior therapy for public speaking anxiety: A randomized clinical trial. *Behaviour Modification*. 2009;33:314–338.

30. Anderson PL, Price M, Edwards SM, Obasaju M a, Schmertz SK, Zimand E, et al. Virtual reality exposure therapy for social anxiety disorder: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*. 2013;81:751–760.

31. Price M, Anderson PL. Outcome expectancy as a predictor of treatment response in cognitive behavioral therapy for public speaking fears within social anxiety disorder. *Psychotherapy (Chicago)*. 2012;49:173–179.

32. Swain J, Hancock K, Hainsworth C, Bowman J. Acceptance and commitment therapy in the treatment of anxiety: A systematic review. *Clinical Psychology Review*. 2013;33:965–978.

33. Ayres J, Hopf T. *Coping with speech anxiety.* Norwood, NJ: Ablex; 1993.

34. Walser R, Westrup D. Acceptance and commitment therapy for the Tteatment of post-traumatic stress disorder and trauma-related problems: A practitioner's guide to using mindfulness and acceptance strategies. Oakland, CA: New Harbinger Publications; 2007.

Journal Article

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Acceptance and Commitment Therapy for Public Speaking Anxiety - A Case Series Study of Effects on Self-reported, Implicit, Imaginal, and In-vivo Outcomes

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Abstract

Public speaking anxiety (PSA) is a common problem, and in some cases can lead to social and occupational difficulties. While exposure therapy combined with cognitive restructuring is currently the most effective treatment available, approximately 25% of individuals fail to respond.

Acceptance and Commitment Therapy (ACT), a third-wave behavioural approach predicated on supposed different mechanisms of change, may have additional benefits to more traditional interventions, and may be more acceptable to those individuals with PSA who find exposure-based therapy too difficult.

A multiple single-case design was used to examine the effects of a self-help ACT intervention for PSA on self-reported, implicit, imaginal, and in-vivo outcomes, across six replications.

All participants reported a reduction in speech anxiety, with evidence of reliable change in three cases. The four participants who reported an

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increase in willingness to approach a feared public speaking scenario, also completed a speech task. Triangulation of the quantitative (daily and weekly measures) and qualitative data (change-interview) indicate that mindfulness (self-as-context and present-moment awareness) may be a key mechanism of change in ACT for PSA.

The findings offer support for ACT to treat speech anxiety, however, further research is needed to generalise these findings and examine the long term effects.

Keywords: public speaking anxiety; social anxiety disorder; treatment; acceptance and commitment therapy

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Introduction

Public Speaking Anxiety

Fear of public speaking, often referred to as public speaking anxiety (PSA), is the anxiety experienced when talking or preparing to talk in front of others. PSA is the most common form of social phobia (Ruscio et al., 2008), with prevalence rates thought to be as high as 85% in the general population (Motley, 1997). Although PSA is a common difficulty, the distress associated with PSA lies on a continuum (Bogels et al., 2010); thus, some people may experience mild distress, while others may find the difficulty debilitating. In some cases, the level of anxiety associated with speaking in public can result in a reduced chance of continued education, work-related distress or unemployment (Aderka et al., 2012; Stein, Walker, & Forde, 1996). Unfortunately, many of those who experience PSA do not seek treatment (Bebbington et al., 2000), possibly due to feelings of shame or embarrassment, or because of a fear of negative appraisal from others (Olfson et al., 2000). If left untreated, social phobias such as PSA generally become chronic (Craske, 1999).

[See Extended Paper 1.1 for a discussion on the epidemiology and impact of PSA]

Research indicates a sizable minority (10%) of the general population meet the Diagnostic and Statistical Manual of Mental Disorders' (DSM IV; American Psychiatric Association, 1994) criteria for social anxiety disorder (SAD), based on their fear of public speaking (Stein, Walker, & Forde, 1996). The current version of the DSM (DSM-V; American

Psychiatric Association, 2013) recognises PSA as a non-generalised SAD if characterised by a marked and persistent fear of performance situations where embarrassment might occur and exposure to this situation causes an immediate anxiety response.

Theories of PSA

There are a number of established theories for the occurrence of PSA. These theories have influenced the development of treatments for those willing to access them:

- The cognitive perspective links the fear caused by public speaking to the thoughts the individual has about his or her inability to perform, an attentional bias towards somatic responses, and the likelihood of receiving negative evaluation (Clark & Wells, 1995; Meichenbaum, 1985). Treatment grounded in this perspective therefore seeks to modify the thoughts associated with public speaking to alleviate distress.

- Behavioural understanding, grounded in principles of respondent and operant conditioning, suggests that an individual develops a phobia related to speaking in public because they associate the context with aversive consequences (Marshall, Parker, & Hayes, 1982; Ramnerö & Törneke, 2008). Treatment involves learning that public speaking is not aversive by remaining in the feared situation until anxiety is reduced (exposure/habituation).

- An alternative learning perspective suggests an individual experiences apprehension when delivering a speech because he or she does not possess the requisite skills to adequately fulfil the task (Fremouw & Zitter, 1978). Treatment from this perspective focuses on developing these skills.

[See Extended Paper 1.2 for a discussion on theories and treatment of PSA]

Treatment

A recent review found that cognitive behavioural therapy (CBT – a treatment informed by both cognitive and behavioural theories described above) can be effective in treating PSA (Pull, 2012). As most people with generalised SAD also experience PSA (England et al., 2012), treatment is largely guided by the SAD literature (Knappe et al., 2011). Meta-analysis has found that exposure treatment, and exposure treatment combined with cognitive restructuring for SAD, produce a large effect size (d=.80; Gould, Buckminster, Pollack, Otto, & Massachusetts, 1997). However, shortcomings still remain, as approximately 25% of patients fail to respond to this type of therapy (Dalrymple & Herbert, 2007; Heimberg & Magee, 2014), and may continue to seek further treatment following intervention, or remain functionally impaired (Orsillo et al., 2005).

Foa and Kozak (1986) suggested that in some cases, patients can engage in cognitive avoidance strategies during exposure, causing them to 'disconnect' from the feared situation, thereby impairing the habituation process. Acceptance and Commitment Therapy (ACT; Hayes,

Strosahl, & Wilson, 1999) seeks to target such avoidant behaviour, by encouraging an accepting stance, whilst also fostering present-moment awareness (Hayes & Strosahl, 2004); thereby enhancing willingness to engage in anxiety provoking situations (such as public speaking), whilst reducing problematic behaviours (such as cognitive avoidance) that may hinder the habituation process.

The ACT Model of Distress and Anxiety

Grounded in functional contextualism (Hayes, Hayes, Reese, & Sarbin, 1993) and Relational Frame Theory (RFT; Barnes-Holmes, Hayes, Barnes-Holmes, & Roche, 2001), ACT posits that most individuals who experience psychological distress do so as a result of experiential avoidance (the act of trying to reduce or avoid aversive private experiences in the form of thoughts, images, physiological sensations and emotions), psychological rigidity (which prevents an individual from acting in line with their values), and cognitive fusion (merging distressing thoughts with perceptions of the self). According to the ACT model, in order to alleviate psychological distress, one must actively accept unwanted thoughts, images, and bodily sensations (termed 'private events'), whilst engaging in behavioural change (committed action), in accordance with one's values (Hayes & Smith, 2005).

ACT is a non-disorder-specific therapy that essentially encourages willingness, value clarification, and mindfulness (Smout, Hayes, Atkins, Klausen, & Duguid, 2012). From an ACT perspective, anxiety is seen as a normal response that becomes pathological when a person is unwilling to accept it. Research into the efficacy of ACT has found support for the notion that it is attempts to control or avoid anxiety that produce psychological suffering (Hayes et al., 1999). Anxiety disorders are

therefore considered to be the result of this avoidance behaviour and are perpetuated until the client's relationship with anxiety changes. Hence, the ACT approach focuses on achieving a change in this relationship by empowering the client to accept, and develop willingness to experience unpleasant private events and feared situations, in the context of pursuing values-based ends.

[See Extended Paper 1.3 for a discussion on ACT and its application to PSA]

Evidence for the ACT Approach

There is a growing body of evidence that supports the use of ACT to treat a number of disorders such as depression, psychotic disorders and anxiety disorders (Öst, 2014). Although the current research base is small, a review by Sharp (2012) supports the notion that the ACT model may be beneficial in conceptualising and treating many anxiety disorders, including PSA.

In one such study reviewed by Sharp (2012), ACT was compared with cognitive behavioural group therapy (CBGT – an empirically supported treatment for SAD) and a non-treatment control group, for the treatment of PSA (Block & Wulfert, 2000). Both active treatments produced a decrease in anxiety and an increase in willingness associated with a speaking task when compared with the control group; however, measures of willingness increased the most in the ACT group. The researchers stated that these findings were true to the philosophical underpinnings of ACT, and suggested that the ACT participants' willingness would continue to increase beyond the study. However, this was never substantiated, as the study did not include a follow-up investigation.

In a partial replication of the above study, Block (2002) again found that both ACT and CGBT effectively reduced PSA; however, those undergoing ACT showed a significant decrease in their levels of avoidance of a public speaking situation when compared with the CGBT group. Although these studies highlighted ACT as a valid alternative to CBT-informed treatment for PSA, they did not analyse temporal precedence or mediation that would suggest why changes occurred and whether the ACT model predicted these changes.

Single case studies into the efficacy of ACT have proved useful in beginning to understand the mechanisms of change that may play a role in anxiety reduction. One noteworthy case illustration of a man with PSA highlighted that increases in his willingness to accept anxiety, his value-driven behaviour and a reduction in his cognitive fusion following a 12-week ACT intervention, led to ameliorative change (Eifert et al., 2009).

Such results should be treated with caution, however, as it is difficult to establish whether those treated with ACT experienced change as a result of the unique properties of the therapy or whether they were simply reporting perceived changes using the ACT vernacular to which they may have become accustomed. Nevertheless, it seems that those who undergo ACT treatment are more willing, and able to spend longer in public speaking tasks, than those who have undergone CBT (Block, 2002). This indicates that ACT may be a valid and possibly more effective treatment for PSA than the current recommended approach of CBT (National Institute for Health and Clinical Excellence, 2013).

Preliminary research on the use of ACT for PSA is therefore promising, however, this exploration is still in its infancy, with an over-reliance on group studies and trials that have not been designed to tease out mediating processes or demonstrate replications. The current study

therefore aimed to extend the existing knowledge on the use of ACT to treat PSA by taking an in-depth look at the processes of change on an individual level, using multiple subjects. A single case experimental design (SCED) was used to examine the possible mechanisms of change in ACT for the treatment of PSA. As a recent review supported the delivery of ACT in a self-help format (Cavanagh, Strauss, Forder, & Jones, 2014), a guided self-help treatment method was used in the current study. This also allowed for the components of ACT to be examined in a standardised manner across multiple cases.

[See Extended Paper 1.4 for a discussion on the efficacy of self-help psychological interventions]

Implicit Measurement

The present study investigated the effects of ACT on self-reported, behavioural (in-vivo and imaginal), and implicit indices of PSA. An implicit measure was included as such measures appear to be sensitive to cognitions that are potentially less amenable to self-reporting. Evidence for this comes from research showing divergent responses to implicit versus explicit measures of the same construct (Power, Barnes-Holmes, Barnes-Holmes, & Stewart, 2009) and that responses on implicit measures are harder to control or deliberately manipulate in response to instruction (McKenna, Barnes-Holmes, Barnes-Holmes, & Stewart, 2007). Within the mainstream cognitive literature, theorists characterise implicit measures as measuring relatively fast/automatic responses that occur with reduced awareness or control (e.g., Gawronski & Payne, 2010). Research has demonstrated that responses on implicit measures have been shown to predict overt behaviour and potential markers of clinical change (Fazio & Olson, 2003). In other

words, implicit measures may capture responses that might be important for predicting (and potentially influencing) behaviours of interest.

The Implicit Relational Assessment Procedure (IRAP) is an implicit measure with the ability to measure complex (e.g., 'propositional' or 'relational') implicit cognitive processes (Hughes & Barnes-Holmes, 2011). The IRAP has been used to effectively examine implicit differences between a broad range of clinical and non-clinical populations (Barnes-Holmes, Murtagh, Barnes-Holmes, & Stewart, 2010; Parling, Cernvall, Stewart, Barnes-Holmes, & Ghaderi, 2012). Moreover, the IRAP has been shown to be sensitive to ACT treatment (cognitive defusion) (Ritzert, Forsyth, Berghoff, Barnes-Holmes, & Nicholson, 2015), thus supporting the notion the IRAP may be used to measure ACT treatment effects accurately.

Implicit measures purportedly offer a means of measuring responses that are less sensitive to demand characteristics or response sets (McKenna, Barnes-Holmes, Barnes-Holmes, & Stewart, 2007) (e.g., faking 'good' in order to please the researcher/therapist, with whom participants may have developed a bond - or possibly faking 'bad' to undermine study results). As such, inclusion of the IRAP allowed us to triangulate and interpret self-report responses, especially if explicit responses suggested therapeutic change (from pre- to post-intervention) but implicit responses remain unchanged. Hence, under ideal conditions, we expected implicit and explicit responses to be concordant.

The IRAP was therefore chosen in the current study to measure implicit changes over the course of the intervention, and explore whether changes in implicit responses (1) needed to occur for reductions in PSA to take place, and (2) predicted the willing completion of a public speaking task.

[See Extended Paper 1.5 for a further discussion on implicit measures and the IRAP]

Aims and Purpose of the Investigation

The principal aim of the study was to use a multiple single case experimental design to examine the effects of a self-help ACT intervention on PSA, by measuring self-reported, implicit, imaginal, and in-vivo outcomes. Specifically, the research aimed to examine whether the self-help ACT intervention:

- reduced PSA, as measured by the self-statements during public speaking scale (SSPS; Hofmann & Dibartolo, 2000).
  - and if so, which elements of the ACT intervention appeared to produce this reduction (as measured by daily and weekly measures)

- reduced the participant's distress and avoidance of an imagined public speaking scenario, whilst increasing his or her willingness to approach it.

- led to an increase in psychological flexibility (as measured by the daily time-series measure) that preceded reductions in PSA.
- facilitated willing completion of a voluntary public speaking task.

- altered implicit responses towards public-speaking-related stimuli.

Hypotheses

As ACT seeks to increase one's willingness to experience distressing situations and private events (Hayes & Strosahl, 2004) we hypothesised that the intervention would lead to an increase in willingness to approach a feared imagined public speaking scenario as a result of increased psychological flexibility. We also hypothesised that this increase in willingness and psychological flexibility would facilitate the completion of an in-vivo public speaking task. Although ACT does not seek to reduce anxiety per se, we also hypothesised that a secondary effect of the intervention would be a reduction in anxiety associated with public speaking, in line with previous findings (e.g., Block & Wulfert, 2000; Block, 2002; Eifert et al., 2009); however, no hypotheses were made regarding the mechanisms of change involved or the effect the intervention would have on implicit responding.

Clinical Relevance

This study is clinically relevant because it aims to provide evidence for the use of ACT, in a self-help format, to treat PSA. This is important as ACT may be a valid treatment option for individuals with PSA who find existing forms of exposure therapy too anxiety provoking or ineffective, or for individuals who wish to address their PSA without clinic attendance. Moreover, the delivery of ACT in a self-help format may provide a cheaper alternative to direct therapy for services tasked with treating PSA.

The exploratory elements of this research may also inform clinicians treating PSA about the most valuable ACT processes to focus on in the treatment of PSA, and whether implicit measures such as the IRAP may have a clinical utility in measuring treatment effect.

[See Extended Paper 1.6 for a further discussion on the clinical relevance of the study]

Method

Participants

Prospective participants answered advertisements posted around the University of Lincoln and via the university's e-mail system. On contacting the researcher, participants were initially sent a further information sheet about the nature of the study (Appendix A), and completed a brief online questionnaire to ensure they satisfied the following inclusion criteria:

1. Score ≥ 6 on the Self-statements during public speaking scale – Negative (SSPS-N) (within one standard deviation of a speech phobic sample; Hofmann & Dibartolo, 2000), indicating at least a moderate fear of public speaking.
2. ≥ 18 years of age.
3. Not currently receiving, or due to receive, psychotherapy or anxiolytic medication (participants taking non-anxiolytic psychotropic medication were considered).
4. English speaker, with good comprehension (based on the researcher's judgement during the initial meeting).

[See Extended Paper 2.1 for a further discussion on the inclusion criteria]

Design and Procedure

[See Extended Paper 2.2 for a discussion on the epistemological position taken, and the single case experimental design]

In order to investigate the effectiveness of ACT to treat PSA, an A-B multiple baseline single case series (Barlow, Nock, & Hersen, 2008) was used. If participants were eligible, and agreed to take part in the study, they completed the initial battery of tests and completed a no-treatment baseline phase for at least five days. During this time, a daily ACT process measure was completed (see Measures). This baseline period acted as each participant's control phase, and was completed until a stable or declining trend was achieved (indicating stable or declining psychological flexibility). Once a stable baseline was achieved, participants began the intervention phase. As participants came forward to take part in the study over a four-month period, no participant began the intervention stage at the same time as another, satisfying the (non-concurrent) multiple-baseline design. As the average number of participants in SCED research is six (Smith, 2012), recruitment continued until a minimum number of six participants had completed the study (See Figure 3. for an overview of the SCED).
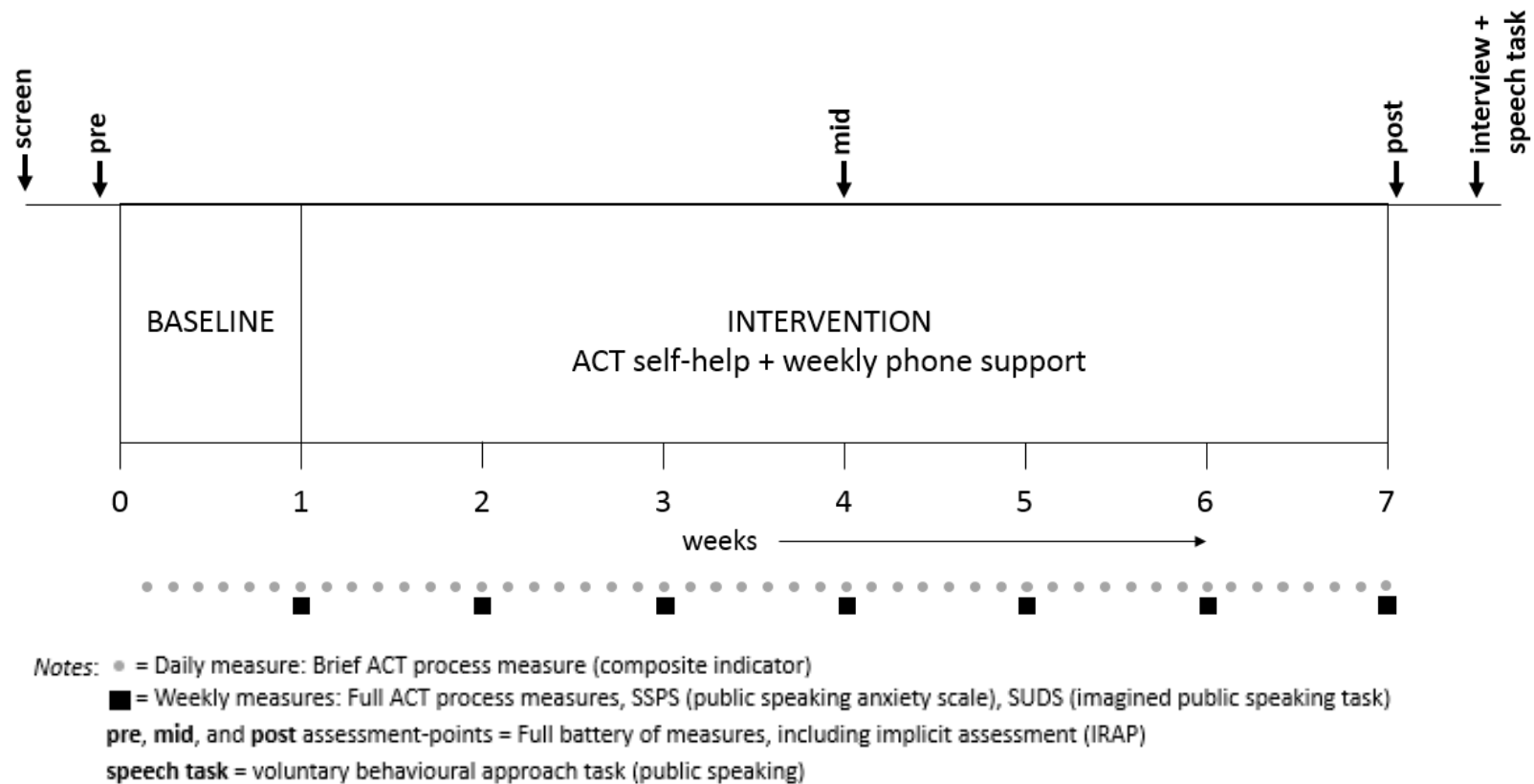
Figure 3. Overview of the SCED used in the present study.

Each participant began the intervention phase by reading the self-help ACT workbook, *Get out of Your Mind and Into Your Life* (Hayes & Smith, 2005) over the course of six weeks. The chapters of this workbook were arranged according to the six ACT processes, so participants read chapters pertaining to a different ACT process each week (see Table 4).

Table 4

Participant Reading and Measures Completed by Week

Intervention stage	ACT process	Chapters	Chapter title/s
Overview of ACT (given to participants after the initial test battery)	N/A	Intro, 1, 2	Introduction; Human Suffering; Why Language Leads to Suffering
Week 1	Acceptance	3,4,9,10	The Pull of Avoidance; Letting go; What Willingness is and is not; Willingness; Learning to Jump
Week 2	Cognitive Defusion	5, 6	The Trouble with Thoughts; Having a Thought vs. Buying a Thought
Week 3	Self as Context	7	If I'm Not My Thoughts, Then Who am I?
Week 4	Present-Moment Awareness	8	Mindfulness
Week 5	Values	11, 12	What are Values?; Choosing Your Values
Week 6	Committed Action	13	Committing to Doing It

Therapist support was provided by telephone once a week. Each participant met with the researcher after three weeks and at the end of the intervention phase to complete the mid- and post-intervention test batteries respectively. Over the course of the intervention, each

participant completed a short daily ACT measure, and a weekly collection of measures (see Measures section).

On completion of the intervention, each participant was invited to complete a Behavioural Approach Task (BAT), in this case, a public speaking task. If the participant agreed, he or she completed the task by giving a partially planned speech of up to 10 minutes on a chosen subject to an assembled audience. This took place around one month after completion of the intervention phase. Each participant's performance was rated by certain members of the audience (see Measures section) and the length of time spent in the BAT was recorded.

A change interview (Elliott, 2010) was conducted by an independent researcher who was blind to the participants' scores on all measures. This change interview investigated each participant's attitude towards the self-help workbook, perceived changes in their PSA, and their perception of the possible reasons for any change. If the participant completed the BAT, then the change interview was conducted within 24 hours after completion. If not, the participant was interviewed one month after he or she completed the intervention phase (see Figure 4 for the study procedure flow-chart).

[See Extended Paper 2.3 for a discussion on ethical considerations]
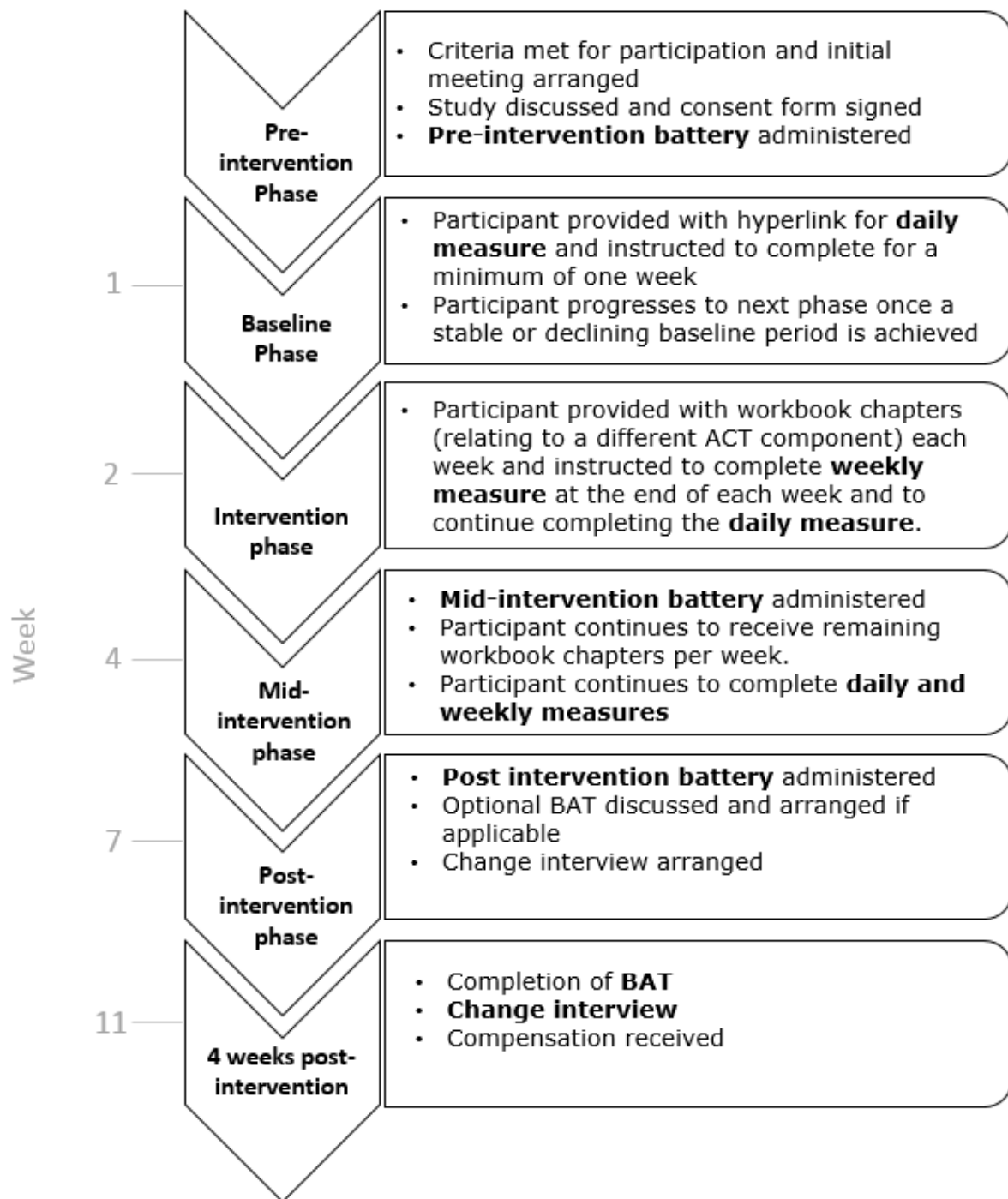
Figure 4. Study procedure according to time and phase

[See Extended Paper 2.4 for further discussion on the study procedure]

Measures

Daily and weekly measures were administered during the study. The daily measure (a composite ACT measure of overall psychological flexibility) consisted of 12 items taken from the validated scales used for the weekly measure and were administered during the baseline phase, and throughout the intervention phase. A test battery was administered at the pre-, mid-, and post-intervention stages.

Weekly Measures

Due to the overlap between the six ACT processes (Hayes, Strosahl, & Wilson, 2012), the weekly measures contained questionnaires related to four key ACT principles: acceptance[2], defusion, mindfulness (present-moment awareness/self-as-context), and valued action (values/committed action). The weekly measures also include two PSA measures (see Table 5) (See appendix B for the Weekly Measures).

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[2] Only the sub-scale related to 'acceptance' from the PHLM was administered.

Table 5

Characteristics and Psychometric Properties of the Weekly Measures

Measure	Construct	N items	Example item	Scale direction	Inter con	Const val	Discr val
Philadelphia Mindfulness Scale (**PHLMS**; Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008)	Acceptance	10	"I try to put my problems out of mind"	1 (never) – 5 (often) (items reversed) High score =↑acceptance	.82$^{\alpha}$	good	good
Cognitive Fusion Questionnaire (**CFQ**; Gillanders et al., 2013)	Cognitive fusion	7	"I struggle with my thoughts"	1 (never) – 7 (always) High score = ↑ cognitive fusion	.90$^{\alpha}$	good	good
Mindfulness Attention Awareness Scale (**MAAS**; Brown & Ryan, 2003)	Self-as-cont / Pres-mom aware	15	"I snack without being aware that I'm eating"	1 (always) – 6 (never) High score = ↑ mindfulness	.82$^{\alpha}$	good	good
Engaged Living Scale (**ELS**; Trompetter et al., 2013)	Values / Com act	16	"I feel that I am living a full life"	1 (disagree) – 5 (agree) High score = ↑ values/com act	.91$^{\alpha}$	good	good
Self-statements during Public Speaking Scale (**SSPS**; Hofmann & Dibartolo, 2000)	PSA	10 (5 pos & 5 neg)	"What I say will probably sound stupid" (neg)	0 (disagree) – 5 (agree) High score (neg) = ↑PSA High score (pos) = ↓PSA	.80$^{\alpha}$ (pos) .86$^{\alpha}$ (neg)	Moderate	Moderate
Subjective Units of Distress Scale (**SUDS**; (Wolpe & Lazarus, 1966)	*Willingness* to approach imagined task	1	"How willing would you be to be in this situation?"	0 (not willing) – 100 (willing) High score = ↑ willingness	-	-	-
	Distress caused by imagined task	1	"How much distress would this situation cause you?"	0 (no distress) – 100 (max distress) High score = ↑ distress	-	-	-
	Desire to *avoid* the imagined task	1	"How much would you avoid this situation?"	0 (no avoidance) – 100 (max avoidance) High score = ↑ avoidance	-	-	-

Note. N items: Number of items; Inter con: Internal consistency; Const val: Construct validity; Discr val: Discriminant Validity; Self-as-cont: Self-as-context; Pres-mom aware: Present-moment awareness; Com act: Committed action: PSA; Public speaking anxiety: neg: negative scale; pos: positive scale. $^{\alpha}$ denotes Cronbach's alpha coefficient

Daily Measure

Participants completed a daily questionnaire to record regular time series data (Appendix C). This composite ACT measure of overall psychological flexibility included 12 items relating to four key ACT concepts (three items per concept): acceptance, defusion, mindfulness (present-moment awareness/self as context) and valued action (values/committed action). The items were derived from the weekly measures, based on face validity and high factor loadings found in previous research investigating their psychometric properties. For example, the statement, "There are things I try not to think about" was included to measure acceptance from the PHLMS, due to the question's high factor loading (.66) and face validity for (non-) acceptance (Cardaciotto et al., 2008). High scores on the daily measure indicated high psychological flexibility.

Test Battery

The test battery consisted of the same psychometrics as included in the weekly measures, with the addition of the IRAP (Barnes-Holmes et al., 2006). The IRAP is an implicit measure that captures response tendencies with respect to propositional stimuli, allowing for the nuanced capture of cognitions/verbal responses towards target stimuli (Barnes-Holmes, Barnes-Holmes, Stewart, & Boles, 2010). The IRAP is a computerised latency assessment tool where, in the present study, respondents were instructed to respond to public speaking images in a manner that was alternately consistent, and inconsistent with their beliefs. The IRAP postulates that responses that are consistent with implicit beliefs occur more quickly (e.g., public speaking image – "makes me anxious") than responses that are inconsistent (e.g., public speaking image – "does not make me

anxious"). The difference between the response latencies of consistent and inconsistent blocks is calculated and represented as a *D*-score (Hussey, Thompson, McEnteggart, Barnes-Holmes, & Barnes-Holmes, 2015). In the present study, positive *D*-scores indicated a response bias towards public speaking anxiety (i.e., that participants are faster to coordinate with anxiety versus non-anxiety). The *D*-scores recorded over the course of the intervention therefore indicated change in implicit anxiety towards public speaking images (See Appendix D for an example of the IRAP).

Behavioural Assessment Task

The final battery included a voluntary Behavioural Assessment Task (BAT; an impromptu speech task). This task assessed participants' willingness to approach and complete a live public speaking task, and their performance in giving the speech. Participants were asked to give a talk for up to 10 minutes on a subject of their own choosing, to an assembled audience of clinical psychologists and trainee clinical psychologists. Six audience members were chosen at random to rate each participant's performance on the Social Performance Rating Scale (SPRS; Harb, Eng, Zaider, & Heimberg, 2003). The SPRS is a behavioural assessment of social and speech anxiety. Respondents are rated on a scale of 0 (very poor) to 5 (very good) on their gaze, vocal quality, length of speech (e.g., concise and detailed sentences), and level of comfort. The SPRS has demonstrated good inter-rater reliability (.84) and internal consistency (.82) when used to evaluate individuals with PSA (Harb et al., 2003).

This BAT only occurred at the end of the intervention. This was for three reasons: (1) a repeated BAT may have acted as an exposure intervention in and of itself, making it difficult to determine if the ACT intervention resulted in change; (2) the prospect of a final speech

task acted to motivate participants to engage in the workbook; and (3) it provided participants with a 'real-life' scenario in which to apply what they had learned from the self-help workbook, and to discuss during the post-intervention change interview.

Analysis

In order to achieve the first aim of the study (to investigate whether the ACT intervention reduced PSA, and the ACT processes involved), the daily and weekly measures were analysed to determine if changes had occurred over the course of the intervention on measures of PSA and ACT processes. To determine whether any recorded changes were deemed reliable (beyond what could be accounted for due to measurement error at 95% confidence), and clinically significant (placing the participant in a non-clinical range), Jacobson and Truax's (1991) Reliable Change Index (RCI) and Clinically Significant Change methods (CSC; criterion C[3]) were applied respectively (See Table 6 for the RCI values, and CSC cut-offs that were applied for each measure).

[See Extended Paper 2.5 for a further discussion on Jacobson and Truax's (1991) criteria for assessing reliable and clinically significant change]

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[3] According to Jacobson and Truax's criterion C method (1991), an individual achieves CSC if their post-treatment score places them closer to the mean of a 'normal' population than that of a 'clinical' population. To achieve CSC, individuals must also have a pre-treatment score in the clinical range, and their pre-post change must be equal to or above the RCI value.

Table 6

RCI Values and CSC cut-off Scores Applied to the Self-Rated

Measures Completed during the Battery of Tests

Measure	Critical RCI Value*	CSC Cut-off
SSPS-N (Public Speaking Anxiety)	6.53	9.48
PHLMS (Acceptance)	7.59	27.66
CFQ (Cognitive Fusion)	7.74	28.38
MAAS (Present-Moment Awareness)	0.74	4.26
ELS (Values and Committed Action)	8.16	56.41

Notes. SSPS-N: Self-statements during public speaking scale-Negative; PHLMS: Philadelphia mindfulness scale-Acceptance; CFQ: Cognitive fusion Questionnaire; MAAS: Mindfulness attention awareness scale; ELS: Engaged living scale; RCI: Reliable change index; CSC: Clinically significant change
*Individual change-scores ≥ this value were statistically significant at $p \leq .05$

As the SUDS is a subjective measure used to monitor idiographic change during treatment (Milosevic & McCabe, 2015), this measure was not subjected to RCI and CSC analysis. However, these data were inspected for change over the course of the intervention to achieve the secondary aim: to determine whether the ACT intervention reduced participants' distress and avoidance of an imagined public speaking scenario, whilst increasing willingness to approach it.

For the participants who chose to complete the final BAT, an overall score was calculated by averaging each participant's score from the four sub-categories of the SPRS. The percentage time each participant spent in the BAT was also calculated for comparison, thus indicating the number of participants who took part in the BAT, their performance, and the time spent in the task, to investigate whether the intervention facilitated the willing completion of a public speaking task.

To achieve the final aim of the study, the transformed response latency data (*D*-scores) collected during the IRAP for both public speaking trials were averaged, and investigated to determine whether

the ACT intervention led to changes in implicit responses towards public speaking stimuli/images.

As visual analysis remains the 'gold standard' method for the evaluation of SCED data (Smith, 2012), the daily ACT time-series data, from the point of baseline to the end of the intervention phase, were inspected considering the parameters of central tendency, trend, variability, point of change, and overlap, as suggested by Morley, (2015) (see Appendix E for an example of these parameters). Investigation of this process measure enabled us to gauge when and where changes in the theoretically targeted ACT construct (psychological flexibility) occurred, enabling the investigation of the active phases/components of the intervention.

To calculate the treatment effect size, the Percentage Exceeding the Median (PEM; Ma, 2006) method was used[4] on the daily measures data. PEM scores ≥ .9 indicate a 'highly effective treatment'. Scores between, .7 to .9, and scores < .7, indicate 'moderately effective' and 'not effective' treatments respectively (Ma, 2006).

Each participant's responses in the change interview were tabulated and considered alongside quantitative findings, in order to strengthen or refute inferences made regarding the effect of the ACT intervention on reductions in PSA, and the possible mediating factors involved. Evaluation of the change interviews also allowed for the effects of factors extraneous to the treatment process to be considered.

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[4] Using the PEM method, the treatment effect size is produced by calculating the percentage of data points that exceed the median of the participant's baseline scores.

Results

Sample

Seven participants took part in the study, however, one chose to withdraw after the third week[5] (the partial data on this participant were not included for analysis as he/she did not complete the mid-battery assessment). Table 7 displays the sample demographics of the participants who completed the study.

Table 7

Demographics of Sample

Participant	Age	Gender	Occupation	Ethnicity	M/H diagnosis	Prev PSA treatment
P1	39	Female	Undergrad	W/B	N/A	No
P2	19	Female	Undergrad	W/B	Depression	No
P3	20	Female	Undergrad	B/Asian	N/A	No
P4	19	Female	Undergrad	B/Nigerian	N/A	No
P5	51	Male	Lecturer	W/B	N/A	No
P6	24	Female	Undergrad	W/B	N/A	No

Notes: Undergrad: Undergraduate; Ethn: Ethnicity; W/B: White British; B/Asian: British Asian; M/H diagnosis: Current mental health diagnosis; Prev PSA treatment: Previous treatment for public speaking anxiety

The majority of the participants were female undergraduate students (83%). The average age of the participants was 28.66 years (SD=13.34). One participant had a current diagnosis of depression, but was not receiving psychotherapy or anxiolytic medication. No participant/s had previously sought help, or received any psychological or pharmacological intervention for their PSA.

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[5] This participant withdrew from the study due to work commitments which meant she was unable to complete the requisite reading each week.

Battery Measures and BAT Results

RCI and CSC analyses were conducted on the SSPS-N[6] (negative scale), and the four ACT process measures administered during the test batteries. Participants' SUDS responses to the imagined public speaking task, and changes in their implicit responses to public speaking stimuli during the IRAP, were inspected for change. For the participants who chose to complete the BAT (n=4), their total SPRS score and the percentage of time in the BAT were calculated. (See Table 8 for these battery test results).

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[6] The SSPS-N results were subjected to analysis, without the inclusion of the SSPS-P (positive scale), as the presence of negative statements is more closely associated with the presence of PSA, than the absence of positive statements (Hofmann & Dibartolo, 2000). The SSPS-N is therefore more sensitive to PSA treatment than the SSPS-P (Hofmann & Dibartolo, 2000).

Table 8

Outcome of Battery Measures Administered during the Study and Indications of Reliable and Clinically Significant Change on the SSPS-N, PHLMS, CFQ, MASS, and the ELS

Participant	Time	SSPS-N	SUDS-D	SUDS-A	SUDS-W	PHLMS	CFQ	MAAS	ELS	IRAP	SPRS
P1	Pre	17	100	100	0	22	31	2.47	49	0.06	-
	Mid	$7^{R\downarrow, C\downarrow}$	90	50	30	$32^{R\uparrow, C\uparrow}$	24	$3.33^{R\uparrow}$	55	0.94	-
	Post	$4^{R\downarrow, C\downarrow}$	90	20	60	$38^{R\uparrow, C\uparrow}$	$15^{R\uparrow, C\uparrow}$	$3.37^{R\uparrow}$	$60^{R\uparrow, C\uparrow}$	0.56	4.1 / 74%
P2	Pre	21	100	100	10	11	46	3.47	43	0.94	-
	Mid	17	90	100	10	21	38	3.66	48	1.08	-
	Post	16	90	100	10	$26^{R\uparrow}$	39	3.47	50	0.81	DNC
P3	Pre	18	90	60	10	16	46	2.93	52	1.06	-
	Mid	12	70	70	80	$33^{R\uparrow, C\uparrow}$	41	3.27	45	0.80	-
	Post	$11^{R\downarrow}$	70	60	70	$36^{R\uparrow, C\uparrow}$	$31^{R\uparrow}$	$4.13^{R\uparrow}$	56	0.35	3.5 / 100%
P4	Pre	13	100	100	0	30	39	4.4	48	0.70	-
	Mid	11	80	80	80	34	$31^{R\uparrow}$	3.87	53	0.65	-
	Post	$4^{R\downarrow, C\downarrow}$	60	50	70	$39^{R\uparrow}$	$19^{R\uparrow, C\uparrow}$	4.67	$63^{R\uparrow, C\uparrow}$	-0.30	3.0 / 31%
P5	Pre	9	100	90	0	31	27	4.13	55	0.20	-
	Mid	6	80	80	20	31	30	4.33	55	0.80	-
	Post	6	70	70	40	34	25	4.73	58	0.32	4.9 / 98%
P6	Pre	18	100	90	10	21	37	3.07	61	0.60	-
	Mid	15	100	100	10	22	$20^{R\uparrow, C\uparrow}$	$4.2^{R\uparrow}$	65	0.64	-
	Post	13	90	90	10	$32^{R\uparrow, C\uparrow}$	$17^{R\uparrow, C\uparrow}$	$3.93^{R\uparrow}$	65	0.73	DNC

Note. SSPS-N: Self-statements during public speaking scale – Negative; SUDS-D: Subjective units of distress sale; SUDS-A: Subjective Units of Distress Scale-Avoidance; SUDS-W: Subjective units of distress-Willingness; PHLMS: Philadelphia mindfulness scale-Acceptance; CFQ: Cognitive fusion scale; MAAS: Mindfulness attention awareness scale; ELS: Engaged living scale; IRAP: Implicit relational assessment procedure; SPRS: Social performance rating scale (Score and percentage time in task); DNC: Did not complete

[R] denotes Reliable Change at $p<.05$; [C] denotes Clinically Significant Change (from clinical to non-clinical range); ↑ indicates Reliable improvement or Clinically Significant Change.

Self-reported PSA

Although all participants experienced reductions in their *negative thoughts associated with public speaking*, only half showed reliable reductions, as measured by the SSPS-N (P1, P3 and P4) according to the RCI cut-off value (6.53). For two of these participants, these reductions were also clinically significant (P1 and P4)[7] (see Figure 5).
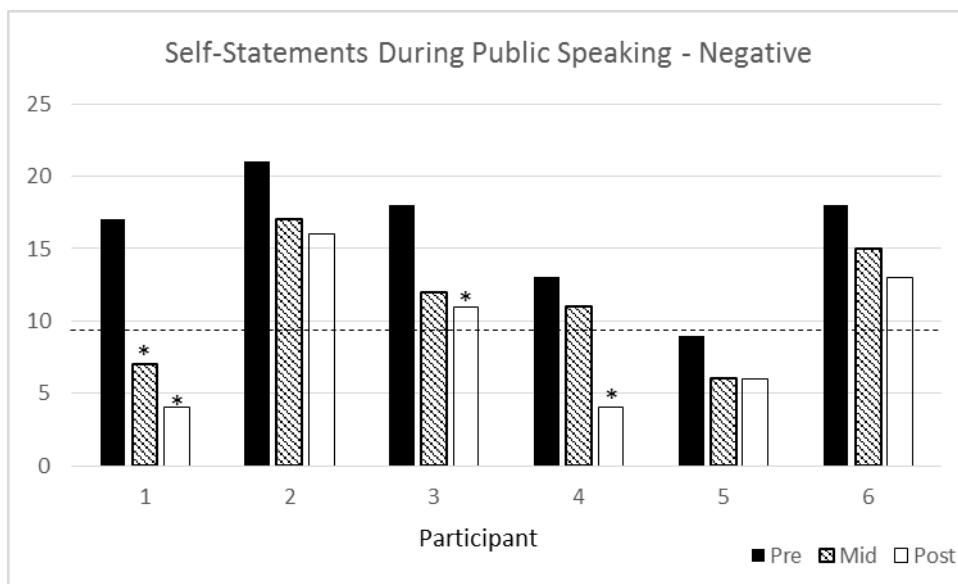
-------- = Clinically significant change
           cut-off (criterion c)

  *   = Reliable change from pre-
           treatment score
           (i.e., change greater
           than RCI Value: 6.53)

Figure 5. Scores on the SSPS-N outcome measure at baseline-, mid-, and post-intervention[8]

[See Extended Paper 3.1 for the analysis of the self-statements during public speaking positive measure (SSPS-P)]

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[7] Although participant 5's post-treatment score reached clinical levels on the SSPS-N, this change was not deemed reliable. This may been a consequence of possible 'floor effects', as participant 5's pre-treatment score was closer to the 'normal' than the 'clinical range' for individuals with PSA (although this participant still met the study's inclusion criteria of a SSPS-N score of ≥ 6).

[8] Reduced scores on the SSPS-N indicate a reduction in PSA.

[See Extended Paper 3.2 for the analysis of weekly changes in PSA as measured by the SSPS-N]

All participants recorded a reduction in *distress* when imagining their most feared public speaking scenario, as measured by the SUDS. On average, participant distress reduced by 23.3%. Half the participants showed a reduction in their *avoidance* of this scenario (P1, P4, and P5), however, the other half did not (P2, P3, and P6). Avoidance reduced by 25% on average for those who experienced change (Figure 6).

Four participants also experienced an increase in their level of *willingness* to approach their feared public speaking scenario (P1, P3, P4 and P5; who also went on to complete the BAT). P2 and P6 showed no change in this domain (and chose not to complete the BAT). Overall, levels of willingness increased by 31.6% (see Figure 6 for all SUDS outcome scores).
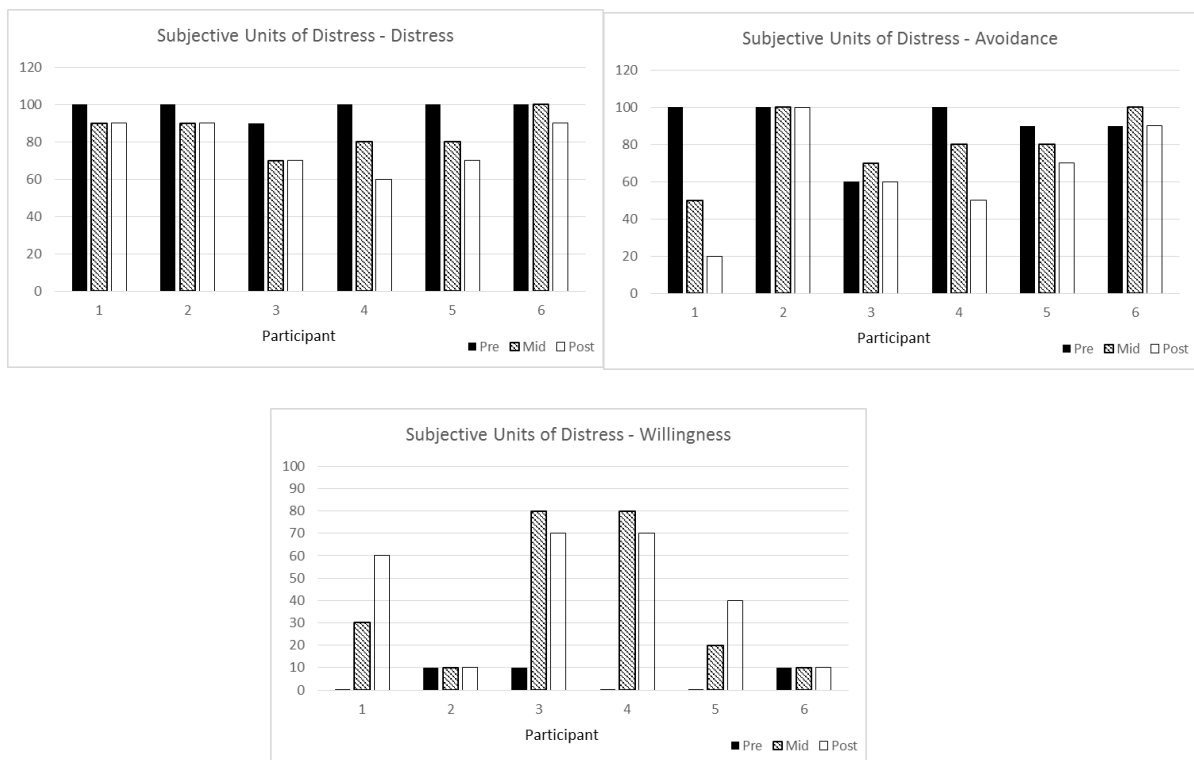
Figure 6. Imaginal SUDS outcome scores at baseline-, mid-, and post-intervention

[See Extended Paper 3.3 for the analysis of weekly SUDS ratings related to the imagined feared public speaking scenario]

P2 and P6 showed either the least change (distress), or no change (avoidance and willingness) in their SUDS scores over the course of the intervention. This measure appeared to predict these participants' behavioural responses, as they were the only participants who chose not to complete the BAT.

The greatest change overall in the SUDS measure was observed for participants P1 and P4. Reductions in these participants' scores on the SSPS-N were also deemed reliable, and they were the only two participants to achieve a clinically significant reduction on this measure. All participants who recorded an increase in their willingness to engage in their feared public speaking scenario also completed the final BAT.

ACT Process Measures

Reliable increases in levels of *acceptance,* as measured by the PHLMS, were evinced in all but one case (P5), with three participants demonstrating clinically significant increases (P1, P3, and P6). *Cognitive fusion* reduced reliably in four cases (P1, P3, P4, and P6), and reached clinically significant levels in three of these cases (P1, P4, and P6). Reliable increases in *present-moment awareness* was seen in three cases (P1, P3, and P6), however, this did not lead to a clinically significant increase in any case. Both reliable and clinically significant increases only occurred in two cases (P1, and P4) with regard to *valued living and committed action*, as measured by the ELS (see Figure 7).
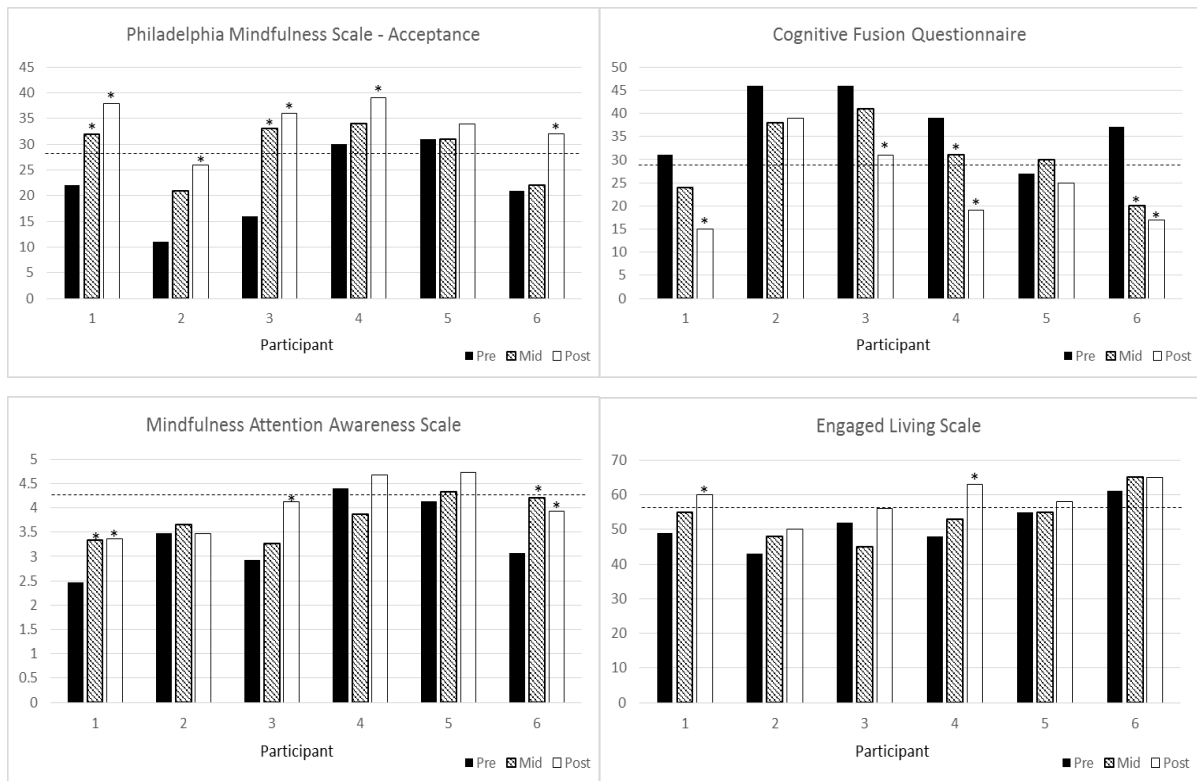
Figure 7. Scores on ACT process measures at baseline-, mid-, and post-intervention[9]

Overall, with the exception of P5, all participants experienced a reliable change in acceptance, and all but two (P2 and P5) in the area of cognitive fusion. P2, P4 and P5[10] did not show reliable changes in present-moment awareness, and no participant reached clinically significant levels post-intervention. Although all participants showed an increase in values and committed action, only P1 and P4 made reliable and clinically significant improvements.

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[9] Increase in score indicates improvement for the PHLMS, MAAS, and ELS, however, a decrease in score on the CFQ indicates improvement (de-fusion)

[10] Although P4 and P5's final scores were above the cut-off for CSC, their overall change in score was not ≥ the RCI value (a prerequisite before CSC can be considered)

Further analysis of the weekly ACT measures, revealed that the majority of reliable change (when considering all the ACT process measures) occurred during the present-moment awareness treatment phase (week 4).

[See Extended Paper 3.4 for the analysis of the weekly ACT process measures and 3.5 for an overall synthesis of these results]

Implicit Change

Changes in implicit responses to public speaking stimuli, as measured by the IRAP, were mixed. The majority of participants showed either little reduction (P2), or an increase in their implicit anxiety associated with public speaking stimuli (P1, P5, and P6), however, one third of participants showed a decrease in their implicit anxiety related to public speaking stimuli (P3, and P4) (see Figure 8).
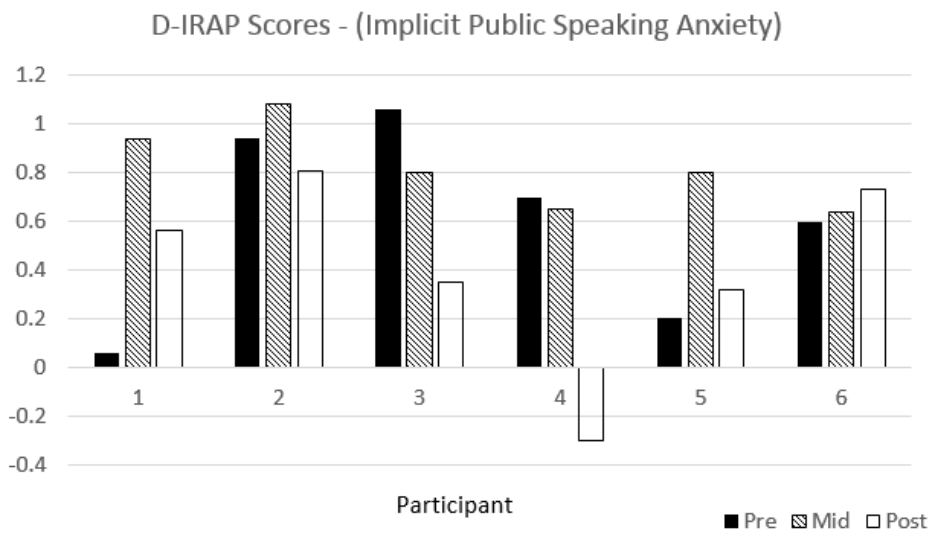
Figure 8. D-scores at baseline-, mid-, and post-intervention[11]

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[11] Reduced D-IRAP scores indicate a reduction in implicit PSA

Four participants completed the final speech BAT (P1, P3, P4 and P5). The percentage of time spent in the BAT ranged from 32% (3:07 minutes) to 100% (10 minutes). The observer ratings of speech performance ranged from 3.0 (fair) to 4.9 (very good), on the SPRS. The average SPRS score for the BAT was 3.88. All participants received a SPRS score higher than the average of a speech-anxious cohort, (2.98; Harb et al., 2003) (indicating a higher performance / level of comfort) (see Figure 9).
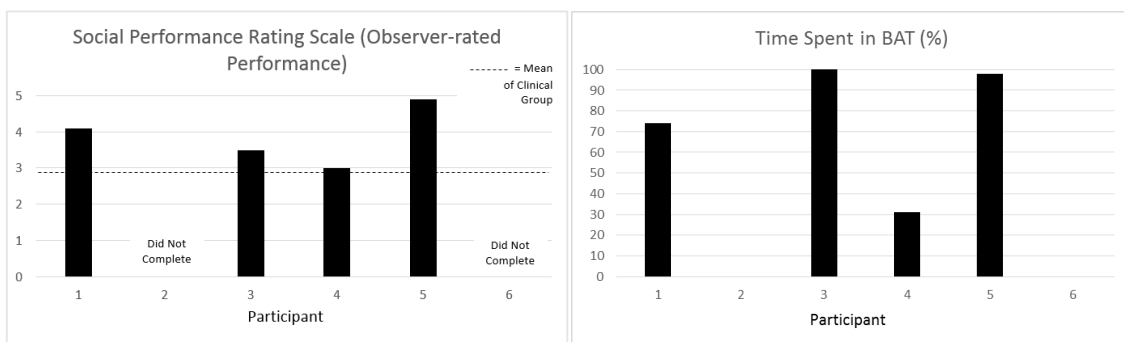
Figure 9. Average observer-rated scores on the SPRS and time spent in BAT

Time-Series Visual Analysis and Treatment Effect Size

Time-series data collected from the daily ACT measures (composite measure of psychological flexibility) were graphed and visually inspected for change across phase and time (see Figure 10). The treatment effect size was also calculated for each participant using the PEM method (Ma, 2006).[12]

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[12] Increases in daily ACT scores indicate greater psychological flexibility.

Participant 1.
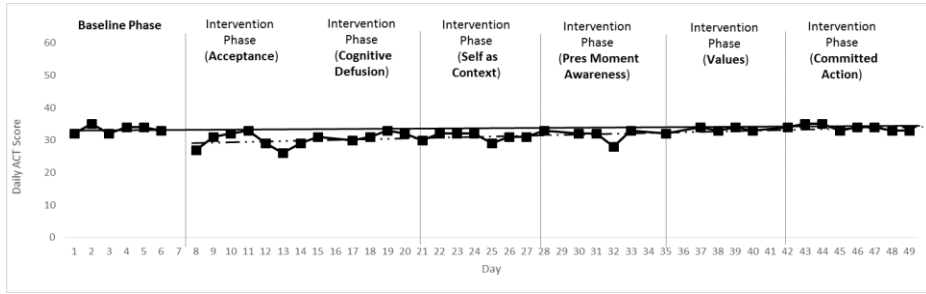
Participant 2.
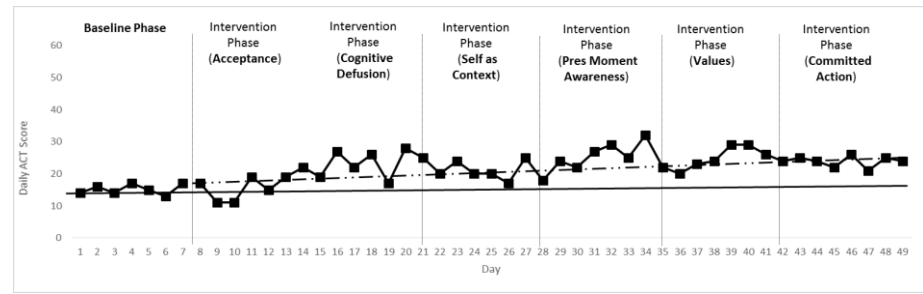
Participant 3.
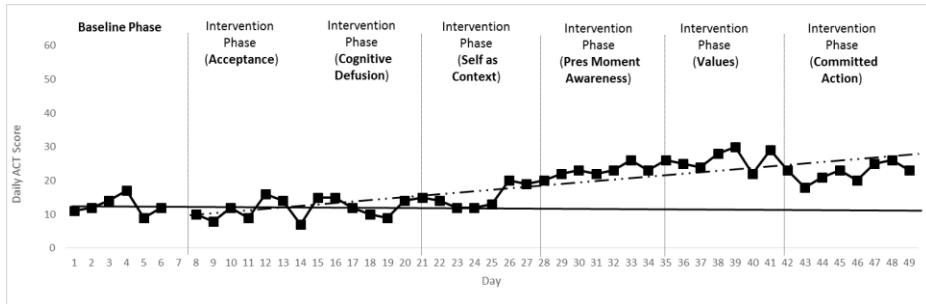
Participant 4.
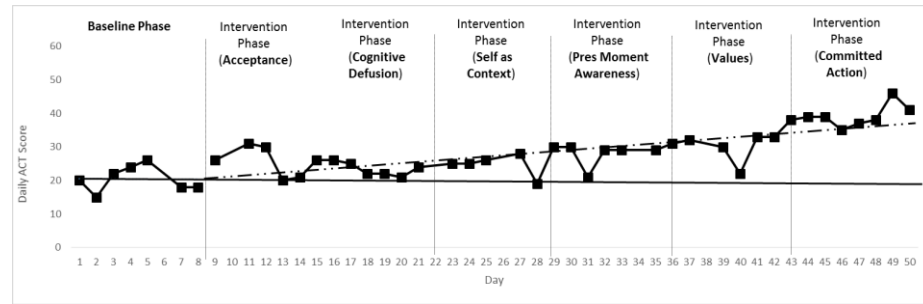
Participant 5.
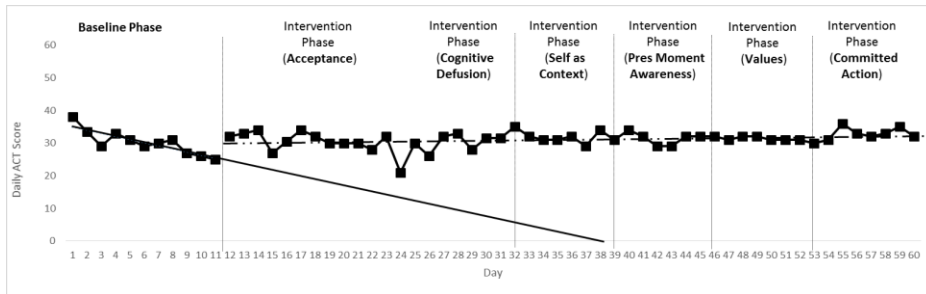
Participant 6.
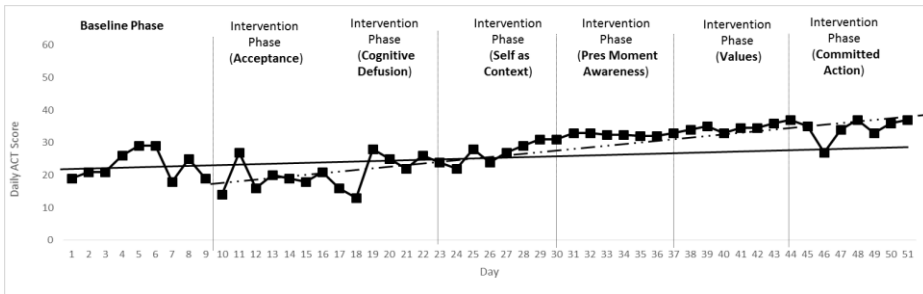
Note. —— Denotes the (predicted) baseline trend line, and ⎯ ⎯ denotes the treatment phase trend line.

Figure 10. Time-series data inspected for change in phase and time using visual analysis and treatment effect using the PEM (Ma, 2006) method

Visual inspection revealed that, during the baseline phase, all participants' psychological flexibility (as measured by the daily ACT) was either stable or in decline prior to the intervention phase. A moderate to large shift in central tendency between phases was observed for four participants (P2, P3, P4, and P6). All participants showed an overall upward trend following the introduction of the treatment phase, however, all participants showed either no change or a reduction in psychological flexibility during the 'acceptance' phase. Moreover, the introduction of the first treatment phase (acceptance) resulted in an immediate increase in psychological flexibility for only two participants (P4 and P5). The majority of participants also showed little change from baseline levels during the 'cognitive defusion' phase, with the exception of P2. However, increases in psychological flexibility were evinced by accelerated trend lines from the point of the 'self as context' phase that continued into the remaining phases of 'present-moment awareness', 'values', and 'committed action', in five out of six cases (excluding P1). Variability between the baseline and intervention phase was observed in four cases (P2, P3, P4, and P6), with increases in variability occurring during the 'self-as-context', 'present-moment awareness', 'values' and 'committed action' phases.

The average treatment effect size was .73, indicating the treatment had an overall moderate effect in increasing psychological flexibility, as measured using the PEM (Ma, 2006; see Table 9). Treatment was deemed 'highly effective' for P2 and P4. Treatment was deemed moderately effective for three participants (P3, P5 and P6), and 'not effective' for P1.

Table 9

Treatment Effect Size by Participant

Participant	PEM/effect size	Interpretation
P1	.17	Not effective
P2	.93	Highly effective
P3	.76	Moderately effective
P4	.95	Highly effective
P5	.73	Moderately effective
P6	.81	Moderately effective

Qualitative/Change Interview Results

Each participant's responses to the final change interview are presented in Table 10 below (see Appendix F for interview schedule).

Table 10

Participant Responses to the Change Interview Questions

Ptp	Understandable	Recommend to other	Influential chapter/s	Changes in PSA	Surprised by changes	Attribute to workbook	Importance of change	N - PS during study	Ext Events	Therapist support	Chose to complete BAT
P1	Yes	Yes	Present-moment awareness	Awareness & Acceptance of anxiety	Somewhat	Unsure	Very important	2	None	Helpful	Yes
P2	No - "Hard to grasp"	Yes	Acceptance	Acceptance of distressing private events/willingness	Neutral	Yes-likely	Somewhat	0	None	Helpful	No – "Too anxious"
P3	Yes	Yes	Values	Acceptance of distressing private events/willingness	Somewhat	Yes-likely	Important	0	None	Helpful	Yes
P4	Yes	Yes	Present-moment awareness & Values	Decreased avoidance of public speaking	Somewhat	Yes-likely	Very important	0	None	Helpful	Yes
P5	Yes	Yes	Present-moment awareness	Separating self from thoughts. Acceptance of distressing private events	Neutral	Yes-highly likely	Neutral	2 x weekly	Raising a new-born	Helpful & supportive	Yes
P6	No – "a lot of theory attached to it"	Yes	Present-moment awareness	Reduced anxiety	Somewhat	Unsure	Very important	0	Passed series of exams	Helpful	No – "I like to fully prepare"

Note. N – PS during study: Number of external public speaking tasks completed during the study; Ext events: Influential external events during study; Ptp: Participant; BAT: Behavioural approach task

The change interview revealed that P2 and P6 found the workbook difficult to read, and also chose not to complete the BAT due to feeling too anxious (P2) or feeling under-prepared (P6). All other participants found the book easy to read and also completed the BAT. All participants said they would recommend the workbook to others. The majority of participants found the present-moment awareness phase the most influential/useful, with P3 and P4 also stating that they found the values phase equally influential. Two thirds of participants stated that they noticed an increase in their acceptance of distressing private events associated with public speaking, whilst the remaining two participants noted either a decrease in their avoidance of public speaking (P4), or a reduction in anxiety associated with public speaking (P6). Four participants attributed this change to the workbook, whilst two participants were unsure whether the workbook was responsible (P1 and P6). In all but one case (P5), changes in PSA were deemed to have been important to the participant. Only two participants gave external speeches/presentations during the life of the study (P1, and P5), and only two participants reported possibly influential life events during the study (P5; raising a new-born child and P6; passing a series of exams). All participants found the weekly therapist support useful.

[See Extended Paper 3.6 for a summary of results for each participant]

Discussion

This study investigated whether a self-help ACT intervention (1) reduced PSA (and the possible mechanisms involved), (2) reduced distress and avoidance, whilst increasing willingness to approach an imagined public speaking scenario, (3) led to an increase in psychological flexibility that preceded reductions in PSA, (4) facilitated the willing completion of a speech BAT, and (5) altered implicit responses towards public speaking stimuli.

Reductions occurred in the primary measure of PSA (SSPS-N) for all participants by the end of the intervention, however, these changes were only deemed reliable in three cases and clinically significant in two, according to Jacobson and Truax's (1991) RCI and CSC criteria. The majority of participants (four), however, showed reductions in avoidance, and an increase in their willingness to approach their idiographic feared public speaking scenario. These participants also chose to complete a final speech BAT, and all received observer ratings above the average for individuals with PSA (Harb et al., 2003; indicating less anxiety). Two participants reported that they found the workbook hard to understand, and they were the only participants who chose not to complete the BAT. However, both of these cases demonstrated increases in psychological flexibility as measured by a moderate to high treatment effect size. This suggests that for these two participants, increases in psychological flexibility did not lead to an increase in willingness to engage in public speaking, and that they may have benefited from a more direct therapeutic approach, to facilitate understanding and behavioural change. However, as both of these participants found the workbook hard to understand, the increase in psychological flexibility in these cases, may reflect socialisation to the ACT model (e.g., the use of 'ACT language'),

rather than an indication that the intervention was having an effect or genuinely increasing psychological flexibility.

The time-series data indicated that the treatment was moderately to highly effective for the majority of cases in increasing psychological flexibility, as measured by the daily measures (excluding P1). Visual analysis and the qualitative information gathered from the change interview suggest that the ACT processes of mindfulness (self-as-context, and present-moment awareness) and values (values and committed action) may be possible mechanisms of change that led to this increase in psychological flexibility, which preceded increases in willingness and reductions in PSA for the majority.

Additionally, the evidence from the weekly measures suggest that all ACT processes may be important, as the participants who went on to complete the final speech BAT (with the exception of P5) experienced reliable shifts in either all (P1), or the majority (P3 and P4) of ACT processes that preceded, or occurred concurrently with increases in willingness, followed by reliable reductions in PSA. However, the majority of these shifts (when considering all the ACT processes) occurred during the mindfulness phases (self-as-context and present-moment awareness), again indicating that the ACT process of mindfulness may be an important mechanism of change.

Conversely, the participant who experienced the least change in PSA, and chose not to complete the BAT (P2), also experienced little change in (weekly) ACT processes. Thus, this indicates that shifts in all ACT processes appear to be influential in increasing willingness to approach public speaking tasks, and reducing self-reported negative thoughts associated with public speaking, for those who went on to complete the BAT.

[See Extended Paper 4.1 for a discussion on participants five and six]

Participants' implicit anxiety associated with public speaking, either remained largely unchanged, or increased. However, the largest reduction in implicit anxiety was seen in the case where the intervention produced the largest effect (P4; .97). This may be due to a number of hypotheses: (1) treatment must be highly effective to result in implicit change, (2) implicit responses do not need to alter to result in increased willingness to engage in public speaking, (3) the treatment was not effective in altering underlying/residual PSA for all, (4) the IRAP used in the current study was not sensitive enough to measure change and requires calibration, (5) ACT may not result in immediate implicit change, but change may occur over time, or (6) the results reflect the goal of ACT; to produce behavioural change without altering distressing private events.

[See Extended Paper 4.2 for a discussion on the IRAP findings, and recommendations for its use in future research]

In line with findings from previous studies investigating ACT to treat PSA (e.g., Block, 2002; Block & Wulfert, 2000; Eifert et al., 2009), we found that the ACT intervention appeared to reduce avoidance, and increase willingness to engage in public speaking. Although reliable and clinically significant reductions in anxiety associated with public speaking were not observed in all cases, our findings appear to reflect previous findings, that public speaking behaviour can increase in the absence of *large* decreases in anxiety (e.g., Block & Wulfert, 2000; England et al., 2012). Given the focus of ACT on altering the function, rather than the form of private events (Hayes & Strosahl, 2004), this may explain why only two cases recorded clinically significant reductions in anxiety, but two thirds chose to complete the speech BAT. Moreover, the measure used to capture reductions in PSA in the current study (SSPS-N) was created within Clark and Wells's (1995) cognitive framework of social anxiety, which views reductions in negative self-statements as an ameliorative sign

(Hofmann & Dibartolo, 2000). However, reducing such statements is not the aim of ACT, as the ACT model predicts that increases in willingness/engagement either precede or are independent of shift in anxiety. Hence, a measure more sensitive to functional change may have resulted in more cases reaching clinical significance. Nevertheless, although reductions in PSA were not all seen as 'clinically significant', all participants' scores on this measure reduced, and all but one participant reported that the changes they noticed in their PSA had been personally important.

[See Extended Paper 4.3 for a further discussion on the findings in the context of extant research and theory]

Strengths and Limitations

The multiple baseline design used in the current study strengthens inferences made regarding treatment effectiveness, as all participants demonstrated stable or declining levels of psychological flexibility during the pre-treatment baseline phase. All participants also began the intervention stage at different times, thus reducing threats to internal validity (Barlow, Nock, & Hersen, 2008; such as history, or maturation). The study design also allowed for both quantitative and qualitative data to be considered in parallel, when making inferences regarding the possible mediating processes involved in ACT to treat PSA (self-as-context, present-moment awareness, values and committed action), however, only tentative support can be given for this hypothesis at this stage. Moreover, as most participants (excluding P5) who completed the BAT also experienced reliable changes in ACT processes, in addition to measures of present-moment-awareness, and values, it seems that all ACT processes may play a mediatory role. However, as two participants experienced an increase in psychological flexibility, in the absence of changes in

committed action outcomes (e.g., willingness and BAT engagement), this weakens the notion that ACT processes are responsible for changes in PSA. Moreover, this finding also indicates that the ACT intervention was ineffective for a third of participants. This suggests that further research is needed to investigate whether ACT is a genuinely effective alternative treatment to existing treatments (e.g., as opposed to CBT) for individual's with PSA, and (2) which individuals may or may not respond to this form of therapy.

Hence, it is possible that increases in psychological flexibility (seen at the end of the intervention) may have been the result of the establishment of a therapeutic relationship between participant and researcher. However, the temporal precedence of ACT process change prior to increases in willingness, followed by reductions in PSA for the majority of those who completed the BAT, indicates a treatment effect/mediatory relationship for those who engaged with the workbook.

Although the majority of participants did not engage in external public speaking tasks during the study, two participants who chose to complete the final speech BAT did (one of whom received the highest observer rating score). This indicates that exposure to the feared stimuli, rather than the ACT intervention, may have resulted in an increase in willingness, and a reduction in anxiety in these cases. Although it can be inferred that the ACT intervention was not the most influential independent variable in this instance, the ACT intervention may have (1) increased the participant's willingness to engage in public speaking tasks, and (2) enabled the participant to habituate successfully during exposure (as a consequence of the development of present-moment awareness). Thus, in these cases, the ACT intervention may have resulted in an increase in exposure to public speaking behaviour throughout the study, and the findings

may reflect the effects of a decrease in experiential avoidance, that facilitated this exposure.

The study also only included a behavioural assessment of public speaking anxiety post-intervention, precluding the temporal assessment of willingness to approach in-vivo public speaking scenarios, and speech performance. However, as noted in the Methods section, such an inclusion may have acted as repeated exposure/confounding variable, thus contaminating the results. Nevertheless, all participants remarked at the beginning of the intervention that they would not have completed a baseline speech task, thereby strengthening inferences that the treatment resulted in this behavioural change for at least four participants.

Finally, to reduce the burden on participants (especially considering the study included a final speech BAT) no follow-up was included in the current study. However, such an inclusion may have allowed us to investigate whether improvements in psychological flexibility continued post-intervention, and resulted in further public speaking behaviour change (both explicit and implicit).

[See Extended Paper 4.4 for a further discussion on the strengths and limitations of the study]

Conclusion

A non-concurrent single-case experimental design investigating the effects of an ACT self-help intervention to treat PSA was presented. The findings offer partial support for the use of ACT, in a self-help format, to treat PSA. Although only tentative support can be given to ACT for PSA at this stage, services may consider how offering patients with such difficulties ACT self-help material in the first

instance, prior to offering direct therapeutic support may be beneficial for those who do not seek treatment if this requires clinic attendance (Bebbington et al., 2000), or for those who find traditional forms of CBT exposure therapy too anxiety provoking (Dalrymple & Herbert, 2007). Such an approach may also reduce the cost of treating PSA, and provide an accessible intervention for individuals who may be at risk of developing a more general form of social phobia if left untreated (Craske, 1999).

Triangulation of the time series, weekly ACT processes and qualitative findings indicate that mindfulness may be a key mechanism of change in ACT. However, the weekly process measures also highlights that all ACT processes may play a role in increasing willingness to approach public speaking. As such, clinicians should ensure that ACT treatment for PSA encapsulates all core elements; however, the development of mindfulness skills may be particularly important for those with PSA. As such, future research may be useful in determining whether the inclusion of mindfulness-based practice increases the effectiveness of traditional exposure-based treatments for PSA (such as CBT), or whether mindfulness is most effective when part of a wider ACT intervention.

As our data indicate, some individuals may require additional support to approach public speaking situations, even after undergoing the self-help intervention; nevertheless, for these individuals, such further intervention may only require a 'light-touch' approach to consolidate new learning, and to encourage in-vivo application.

[See Extended Paper 4.5 for a further discussion on the clinical implications of the findings]

Future Research

This study offers partial support for the use of ACT to treat PSA. As such, future research in this area may strengthen support for its use by investigating the long-term effects on both self-rated and observer-rated anxiety/speech performance by employing a follow-up design. This research should include a gender-balanced sample and a varied age range to allow for greater generalisability. Research should also continue to consider the mechanisms of change involved in ACT for anxiety disorders, such as PSA. Given that present-moment awareness/mindfulness appeared to be an influential mechanism of change reported in our quantitative (time-series, weekly, and battery measures) and qualitative findings (change interview), and a recent study found that mindfulness may be the most influential process when treating SAD related disorders (Kocovski, Fleming, Hawley, Ringo Ho, & Antony, 2015); future research should seek to investigate whether (1) mindfulness is indeed an important mechanism in treating SAD difficulties such as PSA, and (2) why mindfulness may lead to ameliorative change. This may be possible with the further use of SCEDs designed to investigate the temporal effects of delivering ACT in differing sequences to investigate whether an immediate treatment effect occurs for those who undergo present-moment awareness related interventions first. Finally, further research in this field should continue to use implicit measures to investigate the effects that psychotherapeutic interventions have on underlying implicit beliefs, whether implicit beliefs predict behavioural change, and whether these truly need to alter in order for treatment to be considered effective.

[See Extended Paper 4.6 for a further discussion on future research]

[See Extended Paper 5. for a critical reflection on the research process]

<u>Acknowledgements</u>

References

Acarturk, C., Cuijpers, P., van Straten, A., & de Graaf, R. (2009).
Psychological treatment of social anxiety disorder: A meta-
analysis. *Psychological Medicine*, *39*(2), 241–254.
doi:10.1017/S0033291708003590

Aderka, I. M., Hofmann, S. G., Nickerson, A., Hermesh, H., Gilboa-
Schechtman, E., & Marom, S. (2012). Functional impairment in
social anxiety disorder. *Journal of Anxiety Disorders, 26,*393-400.
doi:10.1016/j.janxdis.2012.01.003

American Psychiatric Association. (1994). *Diagnostic and statistical
maunual of mental disorders: DSM-4* (4th ed.). Arlington, VA:
American Psychiatric Publishing.

American Psychiatric Association. (2013). *Diagnostic and Statistical
Maunual of Mental Disorders: DSM-5* (5th ed.). Arlington, VA:
American Psychiatric Publishing.

Barlow, D. H., Nock, M. K., Hersen, M. (2008). *Single case research
designs: Strategies for studying behavior change* (3rd ed.). New
York: Allyn & Bacon.

Barnes-Holmes, D., Barnes-Holmes, Y., Power, P., Hayden, E., Milne,
R., & Stewart, I. (2006). Do you really know what you believe?
Developing the implicit relational assessment procedure (IRAP) as

a direct measure of implicit beliefs. *The Irish Psychologist*, *32*, 169–177.

Barnes-holmes, D., Barnes-holmes, Y., Stewart, I., & Boles, S. (2010). A sketch of the implicit relational assessment procedure (IRAP) and the relational elaboration and coherence (REC) model. *The Psychological Record*, *60*, 527–542.

Barnes-Holmes, D., Murtagh, L., Barnes-Holmes, Y., & Stewart, I. (2010). Using the implicit association test and the implicit relational assessment procedure to measure attitudes toward meat and vegetables in vegetarians and meat-eaters. *The Psychological Record*, *60*, 287–305.

Bebbington, P. E., Meltzer, H., Brugha, T. S., Farrell, M., Jenkins, R., Ceresa, C., & Lewis, G. (2000). Unequal access and unmet need: neurotic disorders and the use of primary care services. *Psychological Medicine*, *30*, 1359–1367. doi:10.1017/S0033291799002950

Block, J. A. (2002). *Acceptance or change of private experiences: A comparative analysis in college students with public speaking anxiety*. (Unpublished doctoral dissertation). University of Albany, Albany, USA.

Block, J. A., & Wulfert, E. (2000). Acceptance or change: Treating socially anxious college students with ACT or CBGT. *The Behavior Analyst Today*, *1*, 1–55.

Bogels, S. M., Alden, L., Beidel, D. C., Clark, L. A., Pine, D. S., Stein, M. B., & Voncken, M. (2010). Social anxiety disorder: Questions and answers for the DSM-V. *Depression and Anxiety*, *27,* 168-189.

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*, 822–848. doi:10.1037/0022-3514.84.4.822

Cardaciotto, L., Herbert, J. D., Forman, E. M., Moitra, E., & Farrow, V. (2008). The assessment of present-moment awareness and acceptance: the Philadelphia mindfulness scale. *Assessment*, *15*, 204–223. doi:10.1177/1073191107311467

Cavanagh, K., Strauss, C., Forder, L., & Jones, F. (2014). Can mindfulness and acceptance be learnt by self-help?: A systematic review and meta-analysis of mindfulness and acceptance-based self-help interventions. *Clinical Psychology Review*, *34*, 118–129. doi:10.1016/j.cpr.2014.01.001

Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In: M. Heimberg., D. Liebowitz., A. Hope &, F. R. Schneier (Eds.),

Social Phobia: Diagnosis, Assessment, and Treatment. New York: Guilford Press.

Craske, M. G. (1999). *Anxiety disorders: Psychological approaches to theory and treatment*. New York: Basic Books.

Dalrymple, K. L., & Herbert, J. D. (2007). Acceptance and commitment therapy for generalized social anxiety disorder: a pilot study. *Behavior Modification*, *31*, 543–568. doi:10.1177/0145445507302037

Eifert, G. H., Forsyth, J. P., Arch, J., Espejo, E., Keller, M., & Langer, D. (2009). Acceptance and commitment therapy for anxiety disorders: Three case studies exemplifying a unified treatment protocol. *Cognitive and Behavioral Practice*, *16* (4)*,* 368-385. doi:10.1016/j.cbpra.2009.06.001

Elliott, R. (2010). Psychotherapy change process research: Realizing the promise. *Psychotherapy Research : Journal of the Society for Psychotherapy Research*, *20*(2), 123–135. doi:10.1080/10503300903470743

England, E. L., Herbert, J. D., Forman, E. M., Rabin, S. J., Juarascio, A., & Goldstein, S. P. (2012). Acceptance-based exposure therapy for public speaking anxiety. *Journal of Contextual Behavioral Science 1(2),* 66-72. doi:10.1016/j.jcbs.2012.07.001

Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology*, *54*, 297–327. doi:10.1146/annurev.psych.54.101601.145225

Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin*, *99*, 20–35. doi:10.1037/0033-2909.99.1.20

Fremouw, W. J., & Zitter, R. . (1978). A comparison of skills training and cognitive restructuring-relaxation for the treatment of speech anxiety. *Behavior Therapy*, *9*(2), 248–259.

Gawronski, b. Payne, B. (2010). *Handbook of implicit social cognition: Measurement, theory and application*. New York: Guilford Press.

Gillanders, D. T., Bolderston, H., Bond, F. W., Dempster, M., Flaxman, P. E., Campbell, L., … Remington, B. (2013). The development and initial validation of the cognitive fusion questionnaire, *Behavior Therapy 45*(1), 83-101. doi:10.1016/j.beth.2013.09.001

Gould, R. A., Buckminster, S., Pollack, M. H., Otto, M. W., & Massachusetts, L. Y. (1997). Cognitive-behavioral and pharmacological treatment for social phobia: A meta-analysis. *Clinical Psychology: Science and Practice*, *4*, 291–306. doi:10.1111/j.1468-2850.1997.tb00123.x

Harb, G. C., Eng, W., Zaider, T., & Heimberg, R. G. (2003). Behavioral assessment of public-speaking anxiety using a modified version of the social performance rating scale. *Behaviour Research and Therapy*, *41*(11), 1373–1380. doi:10.1016/S0005-7967(03)00158-X

Hayes, S. C., Barnes-Holmes, D., & Roche, B. (2001). Relational frame theory: a post-Skinnerian account of human language and cognition. *Advances in Child Development and Behavior*, *28*, 101–138. doi:10.1016/S0065-2407(02)80063-5

Hayes, S. C., Hayes, L. J., Reese, H. W., & Sarbin, T. R. (1993). *Varieties of scientific contextualism.* New York: New Harbinger.

Hayes, S. C., & Strosahl, K. D. (2004). *A practical guide to acceptance and commitment therapy*. New York: Springer.

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

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2012). *Acceptance and commitment therapy: The process and practice of mindful change*. New York: The Guilford Press.

Hayes, S., & Smith, S. (2005). *Get out of your mind and into your life*. Oakland, CA: New Harbinger.

Heimberg, R. G., & Magee, L. (2014). Social anxiety disorder. In D. H.

Barlow (Ed.), *Clinical handbook of psychological disorders: A step-by-step treatment manual* (pp. 114–154). New York: The Guilford Press.

Hofmann, S. G., & Dibartolo, P. M. (2000). An instrument to assess self-statements during public speaking: Scale development and preliminary psychometric properties. *Behavior Therapy*, *31*, 499–515. doi:10.1016/S0005-7894(00)80027-1

Hughes, S., & Barnes-Holmes, D. (2011). On the formation and persistence of implicit attitudes: New evidence from the implicit relational assessment Procedure (IRAP). *The Psychological Record*, *61,* 391–410.

Hussey, I., Thompson, M., McEnteggart, C., Barnes-Holmes, D., & Barnes-Holmes, Y. (2015). Interpreting and inverting with less cursing: A guide to interpreting IRAP data. *Journal of Contextual Behavioral Science*, *4*, 157–162.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, *59*, 12–19. doi:10.1037/0022-006X.59.1.12

Knappe, S., Beesdo-Baum, K., Fehm, L., Stein, M. B., Lieb, R., & Wittchen, H. U. (2011). Social fear and social phobia types

among community youth: Differential clinical features and vulnerability factors. *Journal of Psychiatric Research*, *45*, 111–120. doi:10.1016/j.jpsychires.2010.05.002

Kocovski, N. L., Fleming, J. E., Hawley, L. L., Ringo Ho, M.-H., & Antony, M. M. (2015). Mindfulness and acceptance-based group therapy and traditional cognitive behavioral group therapy for social anxiety disorder: Mechanisms of change. *Behaviour Research and Therapy*, *70*, 11–22. doi:10.1016/j.brat.2015.04.005

Ma, H.-H. (2006). An alternative method for quantitative synthesis of single-subject researches: Percentage of data points exceeding the median. *Behavior Modification*, *30*(5), 598–617. doi:10.1177/0145445504272974

Marshall, W. L., Parker, L., & Hayes, B. J. (1982). Treating public speaking problems: A study using flooding and the elements of skills training. *Behavior Modification*, *6*(2), 147–170.

McKenna, I. M., Barnes-Holmes, D., Barnes-Holmes, Y., & Stewart, I. (2007). Testing the fake-ability of the implicit relational assessment procedure (IRAP): The first study. *International Journal of Psychology and Psychological Therapy*, *7*, 253–268.

Meichenbaum, D. (1985). *stress inoculation training*. New York: Pergamon.

Milosevic, I., & McCabe, R. E. (2015). *Phobias: The psychology of irrational fear*. Santa Barbra, USA: Greenwood.

Morely, S. (2015). Visual analysis. In S. Morley (Ed.), *Single Case Methods for Busy Clinicians*. Manuscript in preperation.

Motley, M. T. (1997). *Overcoming your fear of public speaking: A proven method*. Boston, USA: Houghton Mifflin.

National institute for Health and Clinical Excellence. (2013). Social anxiety disorder: recognition, assessment and treatment. Retrieved from http://publications.nice.org.uk/social-anxiety-disorder-recognition-assessment-and-treatment-cg159/recommendations#interventions-for-adults-with-social-anxiety-disorder-2

Olfson, M., Guardino, M., Struening, E., Schneier, F. R., Hellman, F., & Klein, D. F. (2000). Barriers to the treatment of social anxiety. *The American Journal of Psychiatry*, *157*, 521–527. doi:10.1176/appi.ajp.157.4.521

Orsillo, S. M., Roemer, L., Block-Lerner, J., LeJeune, C., & Herbert, J. D. (2004). ACT with anxiety disorders. In S. C. Hayes & K. D. Strosahl (Eds.), *A practical guide to acceptance and commitment therapy* (pp.103-132). New York: Springer.

Öst, L.-G. (2014). The efficacy of acceptance and commitment therapy: An updated systematic review and meta-analysis. *Behaviour Research and Therapy*, *65*, 105–121. doi:10.1016/j.brat.2014.07.018

Parling, T., Cernvall, M., Stewart, I., Barnes-Holmes, D., & Ghaderi, A. (2012). Using the implicit relational assessment procedure to compare implicit Pro-thin/anti-fat attitudes of patients with anorexia nervosa and non-clinical controls. *Eating Disorders, 20*(2), 127-143. doi:10.1080/10640266.2012.654056

Power, P., Barnes-holmes, D., Barnes-holmes, Y., & Stewart, I. (2009). The implicit relational assessment procedure (IRAP) as a measure of implicit relative preferences: A first study. *The Psychological Record*, *59*, 621–640.

Pull, C. B. (2012). Current status of knowledge on public-speaking anxiety. *Current Opinion in Psychiatry, 25*(1), 32-38. doi:10.1097/YCO.0b013e32834e06dc

Ramnerö, J., & Törneke, N. (2008). *The ABC's of human behavior*. Oakland, CA: New Harbinger.

Ritzert, T. R., Forsyth, J. P., Berghoff, C. R., Barnes-Holmes, D., & Nicholson, E. (2015). The impact of a cognitive defusion intervention on behavioural and psychological flexibility: An

experimental evaluation in a spider fearful non-clinical sample. *Journal of Contextual Behavioral Science*, *4*(2), 112–120.

Ruscio, A. M., Brown, T. A., Chiu, W. T., Sareen, J., Stein, M. B., & Kessler, R. C. (2008). Social fears and social phobia in the USA: Results from the national comorbidity survey replication. *Psychological Medicine*, *38*, 15–28. doi:10.1017/S0033291707001699

Sharp, K. (2012). A review of acceptance and commitment therapy with anxiety disorders. *International Journal of Psychology & Psychological Theory*, *12*, 359–372.

Smith, J. D. (2012). Single-case experimental designs: A systematic review of published research and current standards. *Psychological Methods, 17*(4), 510-550. doi:10.1037/a0029312

Smout, M. F., Hayes, L., Atkins, P. W. B., Klausen, J., & Duguid, J. E. (2012). The empirically supported status of acceptance and commitment therapy: An update. *Clinical Psychologist*, *16*, 97–109. doi:10.1111/j.1742-9552.2012.00051.x

Stein, M. B., Walker, J. R., & Forde, D. R. (1996). Public-speaking fears in a community sample. Prevalence, impact on functioning, and diagnostic classification. *Archives of General Psychiatry*, *53*(2), 169–174. doi:10.1001/archpsyc.1996.01830020087010

Trompetter, H. R., Ten Klooster, P. M., Schreurs, K. M. G., Fledderus, M., Westerhof, G. J., & Bohlmeijer, E. T. (2013). Measuring values and committed action with the engaged living scale (ELS): Psychometric evaluation in a nonclinical sample and a chronic pain sample. *Psychological Assessment*, *25*, 1235–46. doi:10.1037/a0033813

Wolpe, J., & Lazarus, A. A. (1966). *Behaviour therapy techniques*. New York: Pergamon.

Extended Paper

1. Extended Background

1.1   *Epidemiology and Impact of Public Speaking Anxiety*

Although public speaking is a common fear in the general population, around 31-34% of individuals experience substantial PSA when preparing or delivering a speech (Stein, Walker, & Forde, 1996; Stein, Walker, & Forde, 1994). The onset for PSA typically occurs between the age of 13 to 20 (Stein et al., 1996), similar to the age of onset of social anxiety disorder in clinical samples (Amies, Gelder, & Shaw, 1983; Ruscio et al., 2008; Solyom, Ledwidge, & Solyom, 1986), and appears to be most common in women (71.9%; Stein et al., 1996). Those with PSA are less likely to receive post-high school education, are more likely to be unemployed, and are more likely to have a lower personal income, than individuals without significant public speaking anxiety (Stein et al., 1996).

Those with PSA often report fearful cognitions relating to embarrassing one's self, one's mind going blank, not being able to continue talking, and/or displaying explicit signs of physiological discomfort (Stein et al., 1996). Again, such cognitions are also prototypical of individuals with wider social anxiety disorder (Clark & Wells, 1995). Those with PSA also experience a number of distressing physiological symptoms when anticipating, or during a speech (such as palpitations, muscle tension, confusion, and gastrointestinal discomfort) (Harris, Kemmerling, & North, 2002). To avoid such discomfort, those with PSA often engage in avoidant strategies in anticipation of public speaking (Tillfors & Furmark, 2007). This avoidant behaviour may explain why PSA is associated with higher rates of unemployment and the reduced likelihood of continued education (England et al., 2012).

According to epidemiological data, around 10% of individuals with PSA (in the general population) fulfil the Diagnostic Statistical Manual of Mental Disorders (DSM-4; American Psychiatric Association, 1994) criteria for social anxiety disorder, due to their levels of distress and reduced functional ability (Stein et al., 1996). Since the aforementioned epidemiological study was conducted, however, the DSM-4 has been updated (DSM - 5; American Psychiatric Association, 2013) and now advises that a diagnosis of social anxiety disorder (non-generalised) can be given to individuals with specific performance fears, such as a fear of public speaking. Hence, it is likely that more than 10% of individuals with PSA would reach clinical levels of social anxiety, by modern standards of diagnosis.

Individuals with PSA often report that their speech anxiety is responsible for a number of social and occupational difficulties. For example, people with PSA reported that their distress related to public speaking often interfered with their education, made it difficult to find a job (or advance their career,) and/or caused a marked interference with their normal social activities (Stein et al., 1996).

Models of occupational stress and wellbeing indicate that an individual with severe PSA may be at risk of reduced wellbeing and therefore of developing further psychological difficulties. For example, the Job Demand-Control model (JDC model; Karasek, 1979), suggests that stress and wellbeing (in the workplace) is mediated by the psychological demands caused by an individual's job and their perceived control (see Figure 11).
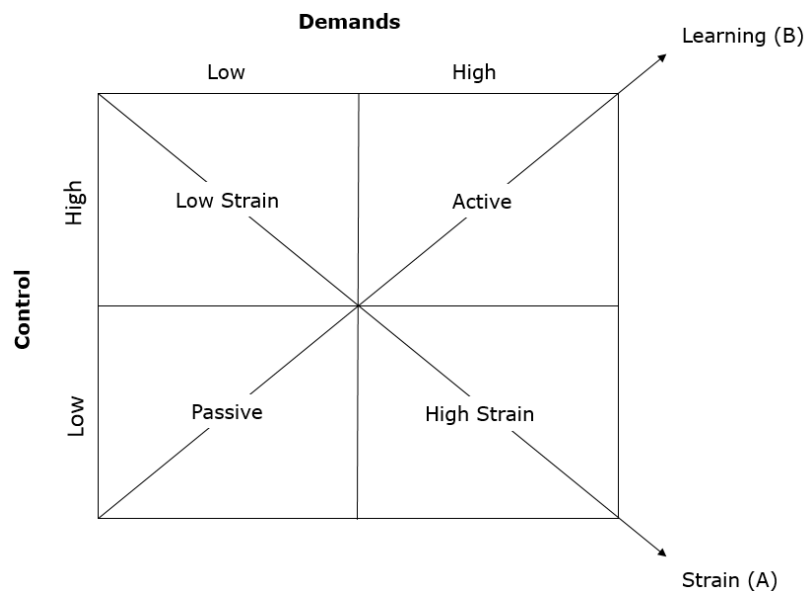
Figure 11. Job demand control model

This model indicates that when an individual experiences high psychological demands, but their level of perceived control is also high, they are likely to develop skills/learn (B). However, if an individual experiences high psychological demands, but their level of perceived control is low, then an individual is likely to experience high levels of psychological and physiological strain (B) (Van der Doef & Maes, 1999) (Figure 9). A review of studies investigating the JDC model revealed it is empirically well supported (Van der Doef & Maes, 1999), and that job demand and control shows several interactional effects with well-being and health (De Jonge, Dollard, Dormann, Le Blanc, & Houtman, 2000).

As individual's with PSA often believe others are negatively evaluating them, they are performing badly, and that they are going to embarrass themselves (Clark & Wells, 1995), they are likely to experience distressing physiological sensations, with which they may become pre-occupied with when contemplating or delivering a speech (Wells, 1997). Hence, according to the JDC model, someone with PSA may feel a high level of strain, if their job entails speaking with groups of people or delivering information in presentation/public speaking formats; due to the psychological and physiological

demands of the task, and their perceived lack of control. The JDC model may therefore explain why those with PSA are more likely to be unemployed, or struggle to advance their career (Aderka et al., 2012; Stein, Walker, & Forde, 1996). Moreover, levels of anxiety and depression have been found to increase linearly along with increasing demands, strain, and reduced control (Sanne, Mykletun, Dahl, Moen, & Tell, 2005). This suggests that someone with PSA may be at risk of developing further mental health problems (if their job requires the completion of public speaking related tasks), or reduced well-being (as a consequence of avoiding desired/values-based career paths, if such paths involve public speaking).

1.2 Theories and Treatment of Public Speaking Anxiety

1.2.1 Cognitive Theory

From a cognitive perspective, phobias such as PSA arise and are maintained by the beliefs an individual holds regarding the object of fear (here, public speaking situations; Clark & Wells, 1995). These beliefs are shaped by the individual's developmental experiences (Beck, 1976). Wells (1997) suggested that three categories of belief content (schema content) play an integral role in SAD, and thus PSA. These are; (1) beliefs regarding the self (core-beliefs; e.g., "I am incompetent"), (2) conditional assumptions (e.g., "If they see I'm nervous, they'll think I'm stupid"), and (3) rigid rules for social performance (e.g., "I must pronounce each word perfectly to be taken seriously"). Hence, public speaking situations are perceived as dangerous. On contemplating, or entering such situations, an individual's negative automatic thoughts activate distressing somatic symptoms (e.g., heart racing) which the individual interprets as further evidence that they are failing to perform (Clark & Wells,

1995). The individual becomes pre-occupied with their somatic responses, resulting in a shift in their focus of attention towards internal events. As such, individuals with PSA interpret how others see them based on these distressing physiological symptoms (interoception). Furthermore, this 'self-focus' of attention prevents the individual from being exposed to evidence that counters their unhelpful beliefs (e.g., an interested audience).

Individuals with social phobias, such as PSA, also engage in behaviours designed to reduce their anxiety (safety behaviours), however, such behaviours often have a paradoxical effect and act to increase an individual's anxious sensations (e.g., speaking quickly, results in breathlessness). Similarly to self-focus, safety behaviours, especially avoidance of public speaking altogether, can also prevent ameliorative experiences. Figure 12 provides an example of how PSA occurs and is maintained using Clark and Wells' (1995) model.
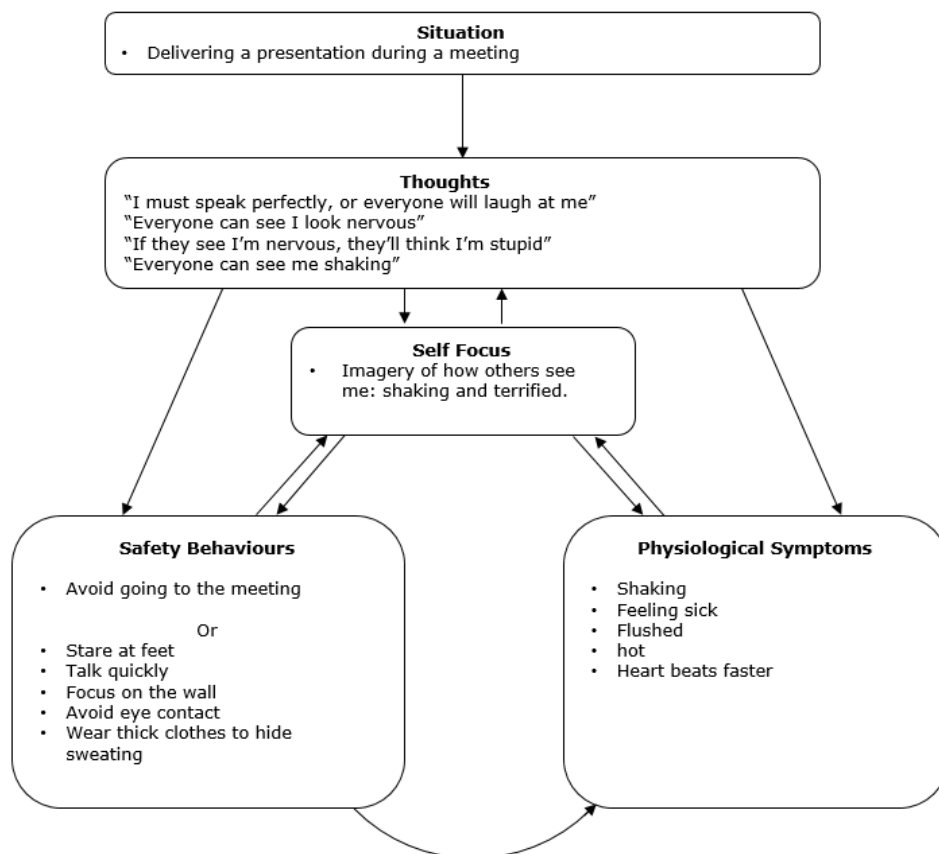
Figure 12. Cognitive model of public speaking anxiety

1.2.2 Cognitive Treatment

Treatment from a cognitive perspective seeks to restructure the patient's unhelpful cognitions by using thought challenging techniques (e.g., reviewing the factual evidence to support or refute unhelpful beliefs) and behavioural experiments (Wells, 1997). For example, someone who fears being ridiculed for not speaking perfectly, may be encouraged to mispronounce selected words during a speech, and then observe the reaction of others. Such experiments often provide the client with evidence against their feared outcome (e.g., people did not seem to notice), thus reducing the strength of their unhelpful beliefs, and therefore their anxiety in future public speaking scenarios.

As successful disconfirmation of an individual's negative appraisals is moderated by attentional and behavioural responses during in-vivo behavioural experiments (Wells, 1997), clients are encouraged to reduce their safety behaviours and self-focus of attention, and attend to external stimuli, during behavioural reattribution tasks (Wells, 1997). Treatment finally focuses on challenging the individual's unhelpful core conditional assumptions, regarding social situations, by supporting the generation of counter evidence (e.g., a pie-chart demonstrating a number of alternative explanations for someone trembling, to test the assumption, "if people see me shaking, they'll think I'm stupid").

1.2.3 Behavioural Theory

Behavioural theory posits that phobias, such as PSA, occur through a dual process of classical (Pavlov, 1927) and operant conditioning (Mowrer, 1947; Skinner, 1974). In the case of PSA, one may associate public speaking stimuli with an aversive consequence (e.g., distressing physiological reactions) following a negative event (e.g.,

freezing on stage). Future avoidance of such stimuli is (negatively) reinforcing (Mowrer, 1947), and therefore, further public speaking scenarios are avoided. This reduces the likelihood that a learning experience will take place to counter this association, thus maintaining PSA.

1.2.4 Behavioural Treatment

Although treatment of PSA often includes interventions informed by cognitive and behavioural theories (CBT; Allen, Hunter, & Donohue, 1989), behavioural treatment alone has been shown to be as effective as CBT when used to treat social phobias (Feske & Chambless, 1995).

Behavioural treatment of anxiety often takes the form of an exposure intervention, whereby the patient is exposed to the phobic stimuli for a prolonged period of time, until their anxiety reduces and they learn that the stimuli is not dangerous (habituation; Foa & Kozak, 1986). This treatment can be delivered during one session (2.1 hours; Ost, 1989) and is referred to as 'flooding'. However, as such a treatment can be initially too distressing for the patient (Orsillo et al., 2005), modern behaviourally informed treatments for phobia's often take the form of 'systematic desensitisation' (McGlynn, Smitherman, & Gothard, 2004). In this approach, originally developed by Wolpe (1958), the patient establishes a hierarchy of anxiety provoking stimuli/situations (e.g., imagining giving a speech, up to, an in-vivo speech), and is then supported in exposure tasks related to this hierarchy (from low-anxiety stimuli, to high), in a stepwise fashion.

Systematic desensitisation has been shown to be effective in treating PSA (Kirsch & Henry, 1979); with more recent research demonstrating the efficacy of this intervention delivered using virtual reality technology, designed to gradually immures the patient in increasingly anxiety provoking virtual public speaking environments

(Anderson et al., 2013; Harris et al., 2002; Safir, Wallach, & Bar-Zvi, 2012; Wallach, Safir, & Bar-Zvi, 2009).

1.2.5 Learning / Skills Acquisition Theory

Both cognitive and behavioural treatments rely on the notion that those with PSA possess the requisite skills to 'perform' during a speech task, once their anxiety has been alleviated (Fremouw & Zitter, 1978). However, research has demonstrated that teaching anxious individuals skills in public speaking, acts to reduce their anxiety during public speaking situations (e.g., Fawcett & Miller, 1975), suggesting PSA is the result of a lack of skills in effective communication/speech. Hence, as supported by social learning theory (Bandura, 1963), a person develops PSA as the skills needed to complete speech tasks have never been learnt through the processes of live, verbal (instructional), or symbolic (e.g., skills guide) modelling.

1.2.6 Skills Acquisitions Training

Treatment therefore involves developing the phobic individual's skills in public speaking through modelling, behavioural rehearsal, and videotape feedback on speech tasks of increasing complexity (Fremouw & Zitter, 1978). Although shown to be an effective treatment for PSA (Wright, 1976), Fremouw and Zitter (1978) suggest that skills training is most effective in treating PSA when combined with cognitive restructuring. Moreover, as skills training involves exposing the individual to public speaking tasks during treatment, it is possible that the mechanism of change in such a treatment also includes exposure, as described above.

1.3 Acceptance and Commitment Therapy (ACT) and Public Speaking Anxiety

The following section presents the underpinning theory of ACT; Relational Frame Theory, and how this theory has shaped the therapeutic process of ACT. ACT is discussed in relation to public speaking anxiety, and a rationale for its use with this population is described.

1.3.1 Relational Frame Theory

ACT is grounded in Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001), a theory of human language acquisition and cognition developed through functional contextual (see epistemological section in extended methodology) behavioural research (Hayes & Strosahl, 2004). A key goal of ACT is to target the processes of language that have been shown to directly control human behaviour, through the application of six core therapeutic techniques (described in section 5.6).

The core notion of RFT is that humans learn to relate events under arbitrary contextual control. For example, complex non-human organisms hold the ability to choose the larger of two randomly selected objects (non-arbitrary relations). However, humans are the only mammal with the ability to bring such responding under contextual control, and apply this process to events unrelated in a concrete/formal sense (Hayes & Strosahl, 2004). These relational responses are 'arbitrarily applicable'. In other words, these responses can be socially-determined. For example, a young child may learn that "X" is larger than "Y", and apply the words "larger than" to other situations e.g., a two pence piece is larger than a five pence piece (e.g., related to the physical size of objects). However, a slightly older child will learned that a five pence piece is larger than a two

pence piece by social attribution (e.g., the five pence piece's socially-determined arbitrary value).

According to RFT, behaviour is considered to be verbal if it holds (1) mutual entailment, (2) combinatorial entailment, and (3) transformation of stimulus functional properties.

- *Mutual entailment* - If an individual learns that A relates to B in a certain context, then this entails a relationship between B and A in that context (e.g., if one learns that the thought "I'm scared" is a *cause* for "running away", one derives that "running away is an *effect* of the thought "I'm scared"; Blackledge, 2003).

- *Combinatorial entailment* - multiple mutual entailments can combine. For example, if (in a given context) A is related to B, and B is related to C, then one can derive that A and C are mutually related (in that given context) (Hayes et al., 2001). Or, in another example, if one learns (in a given context) that a Huntsman spider is bigger than a Black Widow spider, and a Tarantula is bigger than a Huntsman spider, then one will derive that a Black Widow spider is smaller than a Tarantula.

- *Transformation of stimulus function* – making relational responses between stimuli results in a transformation of stimulus function for all the stimuli involved (Blackledge, 2003). Using the previous example, a transformation of stimulus function would occur if someone with a fear of spiders who previously perceived large spiders to be the most dangerous, learnt that a Tarantula is less venomous than a Huntsman, but a Huntsman is less venomous than a Black Widow. In this example, it will be derived that the smallest spider (Black Widow) is now more dangerous than the biggest spider

(Tarantula), and therefore the smallest spider becomes the most feared (transformation of stimulus function) without the need for a direct learning experience.

The above three properties combine to produce a 'relational frame'. Relational framing is considered to be the basis for human language and thought (Hayes, 1989).

1.3.2 RFT and Psychopathology

This theory is clinically relevant because the relational networks developed over time influence an individual's behaviour through the process of derived relations. For example, a child may experience distress, fear and anxiety after being trapped in a lift. In the future, that fear may transform the function of situations where the individual may feel "trapped", such as in a job or relationship. Hence, these relational networks have the potential to cause psychological distress. RFT guided therapy (ACT) therefore targets these relational networks during psychotherapy, however, as relational networks work 'by addition, rather than subtraction' (Hayes & Strosahl, 2004), the aim of ACT is not to eradicate well-conditioned verbal relations, but to alter their behavioural function (Hayes & Strosahl, 2004). Moreover, from an RFT/ACT perspective, it is an individual's attempts to control or reduce negative or distressing relational frames that results in psychopathology.

Relational networks allow humans to solve problems, and plan for the future. In this sense, language has a repertoire *broadening* effect (Hayes & Strosahl, 2004). However, language also has a *narrowing* effect on behaviour, often when used in excess (e.g., thought/rumination). From an RFT/ACT perspective, psychopathology is therefore the result of the narrowing effects of language, and results in psychological inflexibility (the inability to change ones

behaviour, even when it is unhelpful/distressing) as a result of *cognitive fusion* and *experiential avoidance*.

1.3.3 Cognitive Fusion

Cognitive fusion is an individual's 'fused' interaction with their thoughts. Someone who treats an event and their thinking about that event as the same thing, is considered to be 'fused' with their thoughts, and as such, their thoughts have the ability to alter their behaviour. For example, a 'fused' person's thoughts about underperforming during a future speech, are about how they perceive they will actually perform, rather than being perceived as a cognitive process in the present. Therefore, this person may act in a manner to avoid this future performance, by avoiding the situation altogether. This is therapeutically relevant, as cognitive fusion has a narrowing behavioural effect, insofar as an individual has a tendency to act in accordance with their verbal relations (e.g., "I will fail my presentation") and the event (e.g., the presentation), which often strengthens negative relational frames. In other words, an individual who is fused with their cognitions is controlled by their relational frames in a way that confirms them (Hayes & Strosahl, 2004).

The notion that an individual's thoughts affect their behaviour is a key principle of existing CBT models of psychopathology (e.g., Beck, 1976; Clark & Wells, 1995; Wells, 1997), and as such, thoughts are often targeted for re-attribution, as they are considered to be unhelpful and/or irrational (Wells, 1997). From an ACT perspective, however, such an intervention may cause further distress, as this intervention implies that such thoughts must be controlled. ACT conceptualisation would predict that the more an individual tries to control such thoughts, the more fused they become with them (Hayes, Strosahl, Bunting, & Twohig, 2004).

1.3.4 Experiential Avoidance

The second contributor to psychological inflexibility, and therefore, psychopathology, is experiential avoidance. This relates to an individual's attempts to avoid distressing private events (suppression: thoughts, emotions, images, memories etc.) and/or situations (situational escape or avoidance), even if this results in psychological distress (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). For example, a socially anxious individual may attempt to avoid the worries, emotions, and physiological sensations that speaking in front of others cause, by avoiding contexts where groups of people may be present. However, such avoidance may result in poor interpersonal relationships (Antony, Roth, Swinson, Huta, & Devins, 1998) and impairment across the lifespan in social domains (Hayes et al., 2004).

As the private events of an individual with PSA prior to, or during a speech, often cause distress, avoidance of such private events is likely to occur (for example, telling the self "If I don't think about the speech or my racing heart, then I will feel better"). However, evidence suggests that attempts to suppress/avoid private events serve to intensify unwanted thoughts (e.g. Abramowitz, Tolin, & Street, 2001; Wenzlaff & Wegner, 2000), and can reduce the effectiveness of exposure based interventions (Feldner, Zvolensky, Eifert, & Spira, 2003). Experiential avoidance (sometimes referred to as 'cognitive avoidance' in this context) may account for why around 25% of individuals with social anxiety related difficulties, such as PSA, fail to respond to exposure based therapy (Dalrymple & Herbert, 2007), and continue to remain functionally impaired (Orsillo et al., 2005).

From an RFT/ACT perspective, such suppression and avoidance increases distress, as this behaviour prompts the feared private

event, since they inhabit/are based on the same relational frame (Hayes et al., 2004).

1.3.5 ACT and Public Speaking Anxiety

When applied to PSA, the principles of experiential avoidance and cognitive fusion appear to explain why an individual's PSA develops and is maintained. For example, an individual with PSA may be unwilling to experience the normal physiological symptoms of anxiety (e.g., increase in heart rate and temperature) and/or their private experiences ("I could forget my lines") when contemplating a speech, because they believe such reactions are abnormal and should therefore be eradicated. The PSA sufferer's attempts to stop or control such thoughts and reactions, however, have a paradoxical effect; as these 'distracters', become related with the individual's unwanted thoughts, such that they remind the individual of their unwanted thoughts, which become increasingly diffuse.

The individual may then attempt to lower their distress by engaging in psychological (e.g., rumination) and behavioural avoidance strategies (avoidance of the presentation). This emotional and situational avoidance may temporarily reduce the individual's distress, as it is (negatively) reinforcing, however the continuation of this dual avoidance may lead to a constriction of the individual's behavioural repertoire, resulting in a reduction in functioning, and well-being. Hence, this exacerbation of symptomology may potentially lead to the development of further mental health difficulties (e.g. generalised social anxiety) (Orsillo, Roemer, Block-Lerner, LeJeune, & Herbert, 2004).

1.3.6 The Six ACT Processes in treating PSA

Hence, ACT posits that increasing an individual's psychological flexibility produces ameliorative change. Although the goal of ACT is not to reduce distress per se, (but rather encourage willingness to experience distressing private events and contexts, in the service of moving towards/acting in accordance with values), evidence suggests that ACT reduces self-reported, and behavioural measures of distress for a number of anxiety disorders (e.g., generlised anxiety disorder, panic disorder, social anxiety disorder etc; Sharp, 2012), and PSA specifically (Block & Wulfert, 2000; Block, 2002; England et al., 2012; Kishita, Muto, Ohtsuki, & Barnes-Holmes, 2014). This reduction in distress may be a 'secondary effect' that occurs after the avoidance cycle is broken. Hence, such reductions in self-reported and behavioural measures of distress may reflect the individual's increased contact with previously distressing situations and their acceptance of uncomfortable private events.

It is worth noting here that ACT is a non-disorder specific model, and therefore the principles described above apply to all forms of psychological distress (Hayes, 2005). As such, the six core processes of ACT (Figure 13) are used to increase psychological flexibility for individuals in psychological distress (regardless of clinical or non-clinical presentation). The following processes are therefore designed to aid exposure to previously avoided private events, and contexts, through the use of mindfulness based practices, willingness, and behaviour change through value-directed action.

Commitment and Behavior
Change Processes

Contact with the
Present Moment

Acceptance

Values

Psychological
Flexibility

Defusion

Committed
Action

Self as
Context

Mindfulness and
Acceptance
Processes
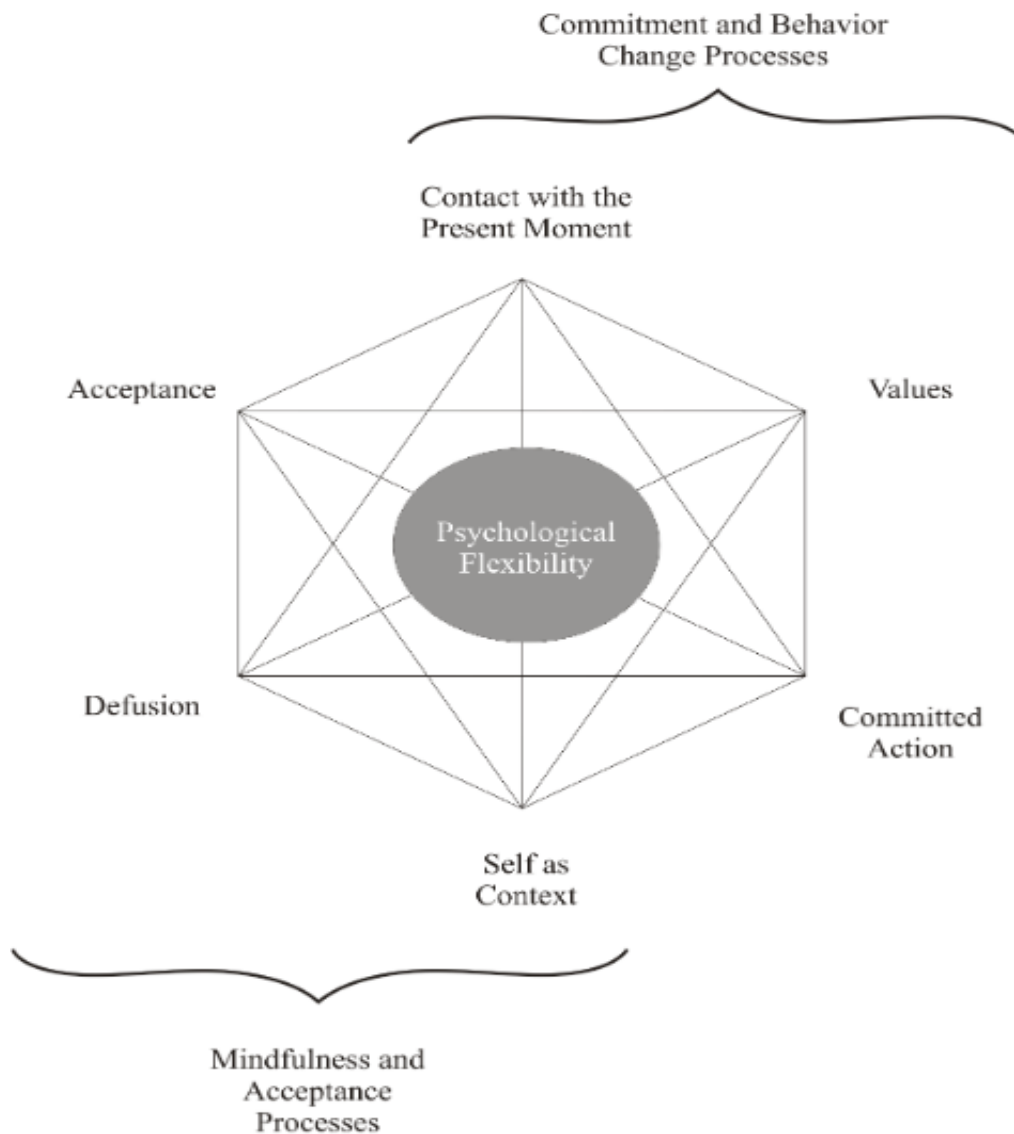
Figure *13.* Six ACT processes targeted during therapy to increase psychological flexibility (Hayes, Strosahl, & Wilson, 1999)

- Acceptance – After the client is made aware of the paradoxical effect that their desire to control their distress has on their psychological well-being, they are encouraged to take an accepting stance. The person is therefore encouraged to embrace their awareness of their physiological sensations, emotions, and thoughts as they arise in the moment. Graded exercises are used to show the individual that they can

experience previously avoided experiences without coming to harm.

- Defusion – This element of ACT seeks to alter the context in which distressing private events occur. As such, cognitive defusion interventions are aimed at encouraging the individual to view their thoughts, emotions, memories etc., as processes of relating, rather than the result of that process (e.g., a thought is just a thought, it is not inherently toxic). This is achieved by a number of experiential exercises designed to allow the individual to view their private events (e.g., thoughts) as processes in the moment, rather than distressing thoughts to be controlled (e.g., Titchener's repetition – the client is encouraged to repeat a distressing thought until the words lose meaning).

- Self-as-Context (or self as process) – In order to aid acceptance and defusion, the client is encouraged to differentiate between the content of their private experiences and the context in which they occur. In other words, a distinction between 'a thought, and the thinker'.

- Present-Moment Awareness (or mindfulness) – Individuals are taught to notice their surroundings, bodily sensations, and private events in the moment, without the influence of thoughts regarding the past or future. Clients are also encouraged to label their experiences in the moment (e.g., "now I am feeling tense"). Contact with the present-moment entails training in mindfulness based practice, and supports the other processes of defusion, acceptance, and self as context (Hayes et al., 2004). Present-moment awareness is also encouraged during exposure interventions (to previously feared situations and/or

private events) to reduce the individual's entanglement with their private experiences, and to teach the client that anxiety is not a 'bad' experience that has to be removed.

- Values – To support the individual with addressing their experiential avoidance, they are encouraged to consider what they want their life to stand for in different areas (e.g., family, career etc.,) in order to orient them to their desired direction in life. In ACT, goals are considered as temporary targets, whereas, 'valued behaviour' is considered a long-term value driven behaviour change. For example, a person with PSA may have the value of continual career progression, however, their avoidance of private events and situations related to public speaking may be preventing this. The person's values are therefore used as a rationale for engaging in exposure to these distressing experiences in order to achieve a valued life.

- Committed Action – Once the individual has identified their values, and realised that they may not be attending to them due to cognitive fusion and experiential avoidance, they are encouraged to make goals in the areas of their 'valued path'. For example, the individual with PSA may set the goal of speaking up during a meeting, whilst engaging in willingness to experience their anxious physiological sensations and private events (whilst also using acceptance and mindfulness processes to support this exposure).

1.3.7 Critique and Application to PSA

ACT purports to be different from therapies such as CBT, as it does not seek to alter the form of the patient's distressing private events (which is seen as damaging from an ACT perspective) but rather the context in which they occur (Hayes et al., 2004). Hence, from an RFT perspective the focus on change through the development of rules in CBT (e.g., "this way of thinking is counterproductive, so must be changed") causes an increase in distress, as such conversations activate previously developed relational frames (Hayes et al., 2004). Rule governed behaviour is therefore often seen as damaging from an ACT perspective; however, taking an approach that does not encourage rule-governed behaviour (e.g., "don't battle with your thoughts, be willing to accept them"), may paradoxically develop a set of behavioural rules for the client (e.g., I must not fight my anxiety"). According to RFT itself, one cannot engage in a conversation without relational networks being activated, and therefore, again, conversations around willingness and relinquishing control, may produce damaging private event (e.g., "I mustn't think that I can't be anxious"). In other words, using language during therapy to undo the damage of language, may be damaging in itself.

Although this may be the case, a benefit of ACT to treat PSA may lie in its ability to support exposure interventions. As evidence suggests that exposure alone is as effective as CBT to treat social anxiety (Feske & Chambless, 1995) and the inclusion of cognitive elements produce no added benefit (Dobson & Khatri, 2000), then psychotherapy that is exposure based may be most efficacious in treating PSA. However, exposure based therapy alone is still ineffective for around a quarter of individuals who undertake such interventions (Dalrymple & Herbert, 2007). This may be due to the inability of the client to cope with their distress during exposure,

and/or their inability to fully experience the feared context, which has been shown to hinder habituation (Foa & Kozak, 1986).

Hence, the focus of ACT on preparing and supporting the client to engage in exposure to previously feared situations and private events using mindfulness and acceptance based practice, combined with the emphasis on value-driven behaviour, may increase the willingness of individuals with PSA to engage in exposure tasks, and also enable them to benefit from such tasks. This makes ACT a potentially valid alternative to CBT or exposure based therapy for individual's wishing to address their PSA.

1.4   Efficacy of Self-help Interventions

There is a growing evidence base for the efficacy of ACT in treating a number of conditions and client groups (Ost, 2008), however, the efficacy of ACT delivered in a self-help format has received less attention.

The National Institute for Health and Care Excellence (NICE) defines 'self-help' principally as a self-administered intervention, in which one uses evidence-based resources such as workbooks and manuals to treat a difficulty or disorder (NICE, 2004). Reviews of self-help psychological interventions, in a CBT format, indicate that both 'pure' self-help (without therapist support) and 'guided' self-help (with light therapist support) may be effective in treating disorders such as anxiety and depression (Coull & Morris, 2011; Newman, Szkodny, Llera, & Przeworski, 2011).

Self-help psychological interventions for individuals with generalised and non-generalised SAD (such as PSA) have also been shown to be effective, when delivered with minimal therapist support (e.g., Furmark et al., 2009; Nordgreen et al., 2012). Such findings suggest

that guided and pure self-help may increase access to psychotherapy for a population who are typically reluctant to seek direct therapist support (Bebbington, Meltzer, et al., 2000; Nordgreen et al., 2012).

1.4.1 Self-help ACT

Following the advent of third-wave cognitive-behavioural therapies, research has turned to investigating whether interventions such as ACT are effective in treating psychological difficulties when delivered in a self-help format (Cavanagh, Strauss, Forder, & Jones, 2014). In a meta-analysis of the extant literature, Cavanagh and colleagues (2014) evaluated the effectiveness of 15 studies employing mindfulness and acceptance based self-help interventions in reducing symptoms of depression and anxiety, and increasing levels of mindfulness and acceptance. Such interventions were found to result in significantly higher levels of acceptance and mindfulness and significantly lowers levels of depression and anxiety in clinical and non-clinical samples, when compared to control conditions. The average effect size was 'small to medium' (Cavanagh et al., 2014), suggesting acceptance and mindfulness can be learnt via self-help, and results in reductions in depression and anxiety; thus further supporting the notion that symptom outcomes may be mediated by changes in psychological flexibility (e.g., Wicksell, Olsson, & Hayes, 2010).

Self-help ACT interventions incorporating guided therapist support appear to yield a larger effect size compared to 'pure' self-help ACT interventions (Cavanagh et al., 2014), however, it is difficult to ascertain whether this is the result of a 'higher dose' effect, or the impact of the therapeutic relationship; a factor generally seen to increase treatment effectiveness (e.g., Lambert & Barley, 2001).

As Cavanagh et al's (2014) review found a relationship between high levels of engagement and positive outcomes, the present study

ensured that engagement with the self-help workbook throughout the intervention was monitored, and supported, via weekly telephone support. The review above also suggested that future research should investigate the mediating role of ACT processes on symptom outcomes (Cavanagh et al., 2014); Hence, the present study repeatedly measured ACT processes during the self-help intervention, as well as public speaking anxiety, to investigate the possible mediating factors involved.

1.4.2 Self-help Psychological Interventions for PSA

Little research has been conducted on the use of self-help psychological interventions for the treatment of PSA. In a review of psychological interventions for PSA (Priestley, Moghaddam, & Dawson, 2014), only two of the studies reviewed employed a self-help intervention. Both studies found that internet-delivered CBT led to a reductions in self- and clinician-rated measures of PSA when compared to no treatment controls (Botella et al., 2010; Gallego, Emmelkamp, Van der Kooij, & Mees, 2011). Moreover, the self-help treatments were comparable to therapist-delivered CBT, with regard to treatment effect. Both studies, however, had significant methodological weaknesses, such as inconsistent recording of control groups and female biased samples (Priestley et al., 2014). Both studies also observed high attrition rates (45.8% and 51.6%), suggesting a lack of engagement and/or that the intervention was ineffective for a significant number of participants. Hence, further methodologically rigorous research is needed to reliably investigate the effectiveness of self-help psychological treatments for PSA (Priestley et al., 2014).

1.5 Implicit Measures and the Implicit Relational Assessment Procedure (IRAP)

1.5.1 Implicit Cognition

The majority of human cognition takes place automatically (and is inaccessible to awareness/attention) and influences social perception, actions, and judgements (Nosek, Hawkins, & Frazier, 2011). Such implicit cognitions can lead individuals to make potentially inaccurate predictions about the intentions or beliefs of others (Dawson, Barnes-Holmes, Gresswell, Hart, & Gore, 2009). In the case of PSA, for example, an individual with the implicit belief that people will evaluate them negatively, may be hypervigilant to audience members who are looking down, or whispering to each other, and interpret this behaviour as confirmation of a poor speech performance. Conversely, an individual with an implicit belief that people are generally welcoming and interested, may perceive the same behaviour as a sign that the audience members are concentrating or are enthusiastic about what is being said, and interpret their performance as a success. Such beliefs are therefore of clinical relevance when treating PSA and measuring the impact of treatment.

1.5.2 Measuring Implicit Attitudes/Beliefs

Such influential implicit beliefs are often measured using self-reports (e.g., Hofmann & Dibartolo, 2000; Leary, 1983) and/or clinical interviews (e.g., Wells, 1997), however, there is considerable evidence to suggest that, due to a lack of awareness or to secondary cognitions that moderate reporting (e.g., sensitivity to therapist expectations), self-reports can be unreliable (De Jong, Pasman, Kindt, & Van Den Hout, 2001). Such methods also rely on an individual's ability to introspect, however, even for the well-

motivated, identification of implicit beliefs through such a method is difficult (Dermot Barnes-Holmes et al., 2006; Greenwald & Banaji, 1995). Moreover, introspection of the self, may also be influenced by the same implicit beliefs that produce an illusory view of others (Nosek et al., 2011). Hence, measurements that do not rely on self-reflections are useful for measuring the underlying mechanisms of social behaviour (Nosek et al., 2011). This does not mean self-reported information is incorrect, but rather the use of implicit measurements may serve as a useful tool in the gathering of clinical information (to inform treatment and/or evaluate treatment outcomes) in combination with self-reported measures.

1.5.3 The Implicit Association Test (IAT)

The most commonly used implicit measure is the Implicit Association Test (IAT; Greenwald & Banaji, 1995). The IAT measures implicit beliefs by recording the strength of an association between two concepts using response latencies. According to the IAT, when asked to respond under time pressure, individuals should respond more quickly to two concepts that are closely linked in memory, than to two concepts that are less closely associated. In the IAT, the participant is required to categorise stimuli as it appears on a computer screen. For example, in Greenwald, McGhee, and Schwartz' (1998) study using the IAT to measure racial attitudes, participants were asked to categorise names as either 'black' or 'white'. In this case, the target concept was race, and the keys the participants chose were labelled 'black' and 'white'. Participants were then asked to categorise a series of words as either 'pleasant' or 'unpleasant' (e.g., cheerful vs. violent). The core element of this experiment, was the combination of both these tasks. Here, the participants were finally asked to complete two final tasks. The first, participants were required to use the response key of black/pleasant and

white/unpleasant, followed by the reverse response key of Black/unpleasant and White/pleasant. The study found that participants were significantly faster at responding when required to link black/unpleasant and white/pleasant, when compared to black/pleasant and white/unpleasant. The study concluded that this quicker response indicated a white in-group bias (Greenwald et al., 1998).

<div align="center">1.5.4 Implicit Measurement of Public Speaking Anxiety</div>

Implicit measurement has since been applied to clinical settings, and has been used to measure the construct of PSA, with encouraging results. Specifically, a number of researchers have found that implicit measures appear to predict behavioural responses to public speaking tasks (Egloff & Schmukle, 2002) and predict treatment success by indicating the likelihood of a 'return of fear' following intervention (Vasey, Harbaugh, Buffington, Jones, & Fazio, 2012).

In the former study, Egloff and Schmukle (2002) found a strong association between those who responded quickly to an IAT linking anxiety to the self, with high levels of observable anxiety/distress during a public speaking task. The researchers concluded that implicit measures may predict behavioural indicators of anxiety, and may also predict 'non-verbal behaviours' that are not captured using self-reports (Egloff & Schmukle, 2002).

In the latter study, Vasey and colleagues (2012) used a post-treatment implicit attitude towards public speaking test (the Personalised Implicit Association Test; PIAT) following an exposure intervention. The researchers found that the PIAT predicted a 'return of fear' in that participants who's automatically activated attitudes remained negative following treatment, were found to have benefited the least from the intervention. In other words, they discovered that in order for the PSA treatment to be effective, the treatment must

alter an individual's automatically activated/implicit attitudes toward the feared stimulus (in this case, public speaking). These findings indicate that (1) implicit measures account for a significant variance in Behavioural Approach Tasks (BATs)/speech performance beyond what is predicted by explicit measures, and (2) implicit measures appear to indicate whether psychological treatments for PSA are effective or not.

Although such studies provide evidence for the use of implicit measures in clinical settings, and support their inclusion in future research investigating treatments for PSA, research employing the IAT methodology (and other such relativistic methods) to measure implicit attitudes should be treated with caution (Dawson et al., 2009). This is because such measures are a relatively indirect way of assessing implicit attitudes/beliefs as they provide an index of associations that are *assumed* to be linked to certain beliefs (De Houwer, 2002). For example, in the previously mentioned IAT race study conducted by Greenwald and colleagues (1998) the results may indicate three possibilities:

1. Participant's preferred white people over black people
2. Participant's liked both races, but preferred white people
3. Participant's disliked both races, but disliked white people less than black people.

To counter the lack of precision inherent in such relativistic measures, a number of non-relativistic measures have been created such as the Go/No-Go IAT (GNAT; Nosek & Banaji, 2001) and the Extrinsic Affective Simon Task (EAST; (De Houwer, 2003).

1.5.5 The IRAP and the Present Study

Since the development of the IAT, a number of implicit measures have been created that provide a more direct measure of implicit beliefs. One such measure is the Implicit Relational Assessment Procedure (IRAP; Barnes-Holmes et al., 2006). Grounded in relational frame theory; a modern theory of human language asserting that all thoughts/cognitions are relational (RFT; Hayes, Barnes-Holmes, & Roche, 2001), the IRAP requires individuals taking the computerised task to respond to a statement in a manner that is either true or false, as quickly and as accurately as possible (for example, "Public speaking – Makes me anxious"). Those taking the IRAP are required to complete sets of 'consistent' blocks (public speaking = makes me anxious) and 'inconsistent' blocks (public speaking = does not make me anxious). The first block is therefore consistent with the beliefs of a person who has PSA, and the second is inconsistent with the beliefs of a person who has PSA.

In line with RFT, it is assumed that an individual's responses will reflect their verbal/non-verbal history. As such, the most likely immediate response will be produced most often. Therefore, during consistent trials, an individual's response is likely to be faster and more accurate, than an individual's responses to an inconsistent trial. Like the IAT, response latencies from consistent vs. inconsistent trials are compared to provide an indication of implicit beliefs. The response time differential between these trials is thought to provide a nonrelative index of the strength of the implicit belief being measured. This immediate difference in responding is named the "IRAP effect" (Barnes-Holmes, Murphy, Barnes-Holmes, & Stewart, 2011).

A number of studies have demonstrated that the IRAP appears to measure an individual's relational networks and, therefore, their

implicit beliefs (e.g., Barnes-Holmes, Waldron, & Barnes-Holmes, 2009; Vahey, Barnes-Holmes, Barnes-Holmes, & Stewart, 2010). A recent review of IRAP studies also noted that the IRAP is a reliable and pragmatically valid measure that may complement self-reports in predicting future behaviours (Golijani-Moghaddam, Hart, & Dawson, (2013). Moreover, evidence also indicates that it is harder for respondents to 'fake' their responses to the IRAP (McKenna, Barnes-Holmes, Barnes-Holmes, & Stewart, 2007) when compared to other implicit measures such as the IAT (Kim & Kim, 2003).

Importantly, this non-relativistic measure uses four trial types that allow for four specific beliefs to be assessed. In the present study, participants were presented with two categories, "*Makes me Anxious"* or "Doesn't make me Anxious", and two sets of target stimuli; images of public speaking scenarios, and images of non-public speaking scenarios (relaxing scenes). The IRAP presented both target stimuli with either label. Hence, four trial types were presented (see Figure 14). The structure of the IRAP, therefore enabled each participant's response to be measured over all trial types over the course of the ACT intervention.
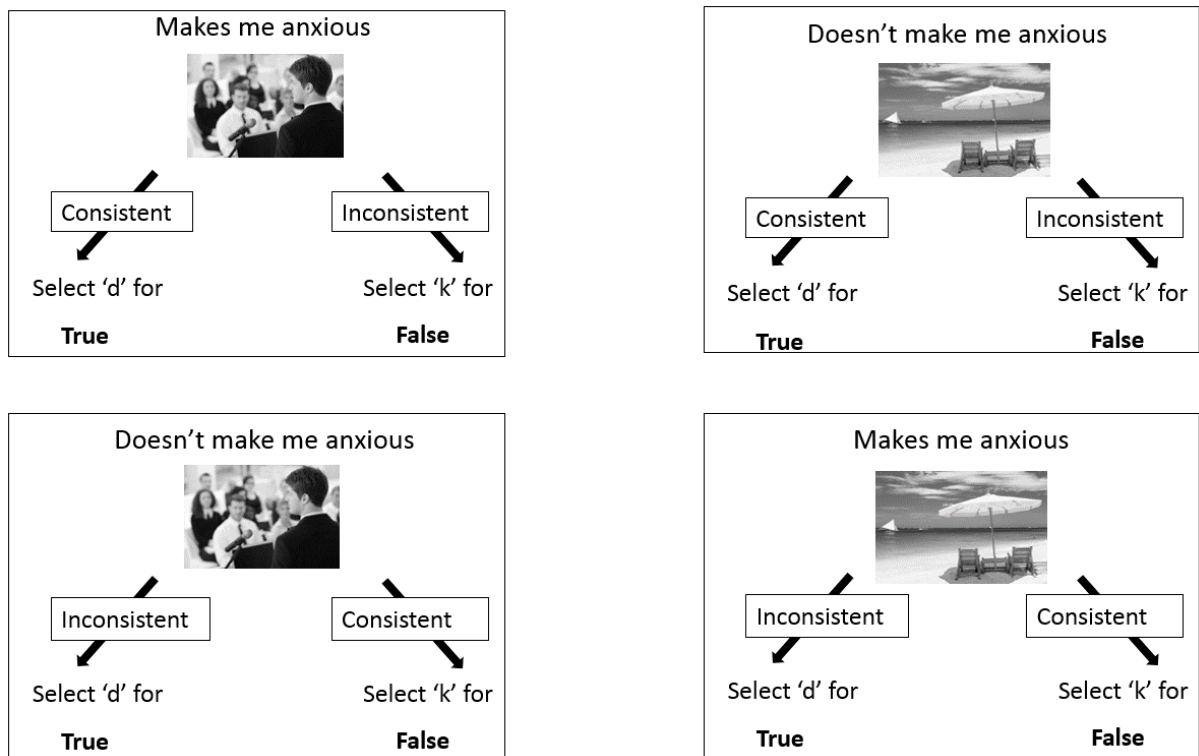
Figure 14. The four IRAP trial-types used in the current study

Note: The arrows denote the responses that were consistent and inconsistent for an individual with PSA.

These were not visible on the screen during the task. If the participant chose a consistent response

during a consistent trial block, and an inconsistent response during an inconsistent trial block, then the

next trial was present in 400 milliseconds. Conversely, if the participant chose an inconsistent response

during a consistent trial block, and a consistent response during an inconsistent trial block, an "X"

appeared on the screen until the correct response was chosen.

Only one study has investigated the IRAP as a clinical tool for measuring the effects of an ACT intervention on individuals with PSA. Kishita, Muto, Ohtsuki, and Barnes-Holmes (2014) measured the effects of an ACT intervention (cognitive defusion) on a number of self-reported and behavioural measures, as well as an anxiety IRAP. The study found that significantly more participants completed the speech task in the ACT group than the control group, however, no significant group difference was found with regard to the self-reported measure of PSA. Significant reductions were found in response latencies on the IRAP in the experimental group only,

however, these reductions occurred in both consistent *and* inconsistent trial types. The researchers hypothesised that the results reflected that 'narrow and inflexible' responding (fusion) inhibits an individual's ability to respond to both trial types, and therefore, a defusion intervention produced significant change in both trials, beyond a practice effect (Kishita et al., 2014).

Such research indicates that defusion may reduce response biases on the IRAP. Such a finding is theoretically consistent with ACT, as treatment is designed to reduce entanglement with thoughts, in a way that alters responses to both IRAP rules.

Although our investigation into the effects of the self-help ACT intervention on the IRAP in the present study was largely exploratory, we tentatively hypothesised that the intervention would lead to a reduction in response bias between the inconsistent and consistent trial types, indicating a reduction in implicit speech anxiety (e.g., a move towards a *D*-score of 0 indicating a reduced bias towards responding to consistent blocks [public speaking image = "makes me anxious"] compared to inconsistent blocks [public speaking image = "doesn't make me anxious"]).

1.6   Clinical Relevance

As indicated in the introduction and the epidemiological data, PSA can lead to significant distress and reduced functional ability that may reach clinical levels in some cases (Stein et al., 1996). Moreover, as with other social anxieties, PSA may become chronic if not treated (Craske, 1999). A proportion of social anxiety research has therefore been dedicated to investigating effective treatments for this difficulty. In a review conducted by Allen, Hunter, and Donohue (1989), effective treatments for PSA appeared to consist of cognitive

modification, exposure, or skills training; with the most effective treatments combining all three elements. However, as this review did not evaluate the methodological rigour of the reviewed studies, this conclusion must be treated with caution.

In an up-dated review that included an assessment of methodological quality, Priestley and colleagues (2014) found that the most reliable evidence suggested that exposure-based treatments for PSA were the most efficacious, and that such treatments could be effectively administered in a self-help / computerised format. This review highlighted that developing treatments for PSA (such as ACT) showed promise, however further rigorous research was needed to determine their effects reliably (Priestley et al., 2014).

Although exposure based therapy appears to be the most effective form of treatment for PSA (Acarturk, Cuijpers, van Straten, & de Graaf, 2009; Allen et al., 1989; Priestley et al., 2014), this treatment is still ineffective for around a quarter of those who undertake it (Dalrymple & Herbert, 2007), possibly due to the distressing nature of exposure therapy (Orsillo et al., 2005), and/or due to possible avoidance strategies that prevent habituation from taking place (Foa & Kozak, 1986). Hence, further rigorous investigation into the effectiveness of alternative therapies, or therapies that re-frame and/or support the process of exposure is warranted. Such further investigation may better inform clinicians tasked with treating the difficulty, and may provide alternative psychotherapy options for individuals with PSA.

Acceptance and Commitment Therapy (ACT) may offer such an alternative treatment, due to the manner in which exposure is framed as an opportunity to increase engagement in valued behaviour (England et al., 2012). Moreover, ACTs focus on developing acceptance of anxiety provoking private events, and present-moment awareness may lead individuals to willingly engage in exposure-based

tasks, and benefit from them (due a reduction in experiential avoidance/cognitive avoidance), respectively (Gloster, Hummel, Lyudminskaya, Hauke, & Sonntag, 2012). The extant research investigating ACT for PSA suggests that this model may be beneficial in treating PSA, however, further methodologically rigorous research is needed to substantiate such claims (e.g., Block & Wulfert, 2000; Block, 2002; England et al., 2012).

As many individuals with social anxiety related difficulties, such as PSA, do not seek treatment (Bebbington, et al., 2000), the investigation of ACT delivered in a self-help format, may have clinical implications for those who do not seek treatment (due to wider social anxiety difficulties), or for individuals who wish to address their public speaking difficulties independently.

A self-help ACT programme for individuals with PSA may also reduce the immediate and potential long term cost to services of treating the difficulty, as such an intervention (1) requires minimal therapist contact, and (2) may act as an early intervention, thus preventing the potential development of further associated chronic difficulties (which may become costly to treat). The development of more cost-effective interventions for presentations of anxiety is clinically pertinent, given that the number of people with anxiety is projected to rise in England, along with the cost of treating the disorder for services, such as the National Health Service (NHS; McCrone, Dhanasiri, Knapp, & Lawton-smith, 2008).

2. Extended Methods

2.1 Inclusion Criteria

To ensure that the participants included in the study were representative of a PSA cohort, each participant was required to score ≥ 6 on the Self-Statement during Public Speaking Scale – Negative sub-scale (SSPS-N; Hofmann & Dibartolo, 2000). This cut-off was chosen as it ensured that all participants fell within one standard deviation (SD=6.3), or above, of the mean of a speech phobic sample (12.3; Hofmann & Dibartolo, 2000). The SSPS-N was used as the screening measure, as this sub-scale is more sensitive to detecting PSA than the SPSS – Positive, or the SSPS scale as a whole (Hofmann & Dibartolo, 2000). As participants were also aware that they would be receiving payment for taking part in the research, this inclusion criteria reduced the likelihood of including individuals who solely wished to take part for monetary gain.

As the present study was limited to investigating the effects of ACT for adults with PSA, individuals < 18 were excluded. Although it was unlikely that prospective participants would not meet this criteria (given that advertisements were placed around the University of Lincoln), it was included to ensure no children or young people were recruited who may have seen the advertisement, but who did not attend the university.

As the current study investigated the effects of ACT to treat PSA, participants in receipt of, or due to receive, any form of psychotherapy were excluded from the sample. Individuals receiving psychotropic medication for anxiety related difficulties were also excluded. This decision was made to increase the likelihood that any changes observed throughout the intervention stage, could be attributed to the ACT intervention; thereby strengthening inferences

regarding treatment effectiveness. Participants prescribed long-term psychotropic medication (for difficulties unrelated to anxiety) were considered (excluding Anxiolytic medication).

As the ACT workbook is written in English, and the participants received therapist support from an English speaking researcher, only English speaking subjects (who demonstrated an acceptable level of comprehension during the initial meeting) were included in the study sample.

2.2 Epistemology and Single-case Experimental Designs

2.2.1 Functional Contextualism

The present study was designed and conducted from a functional contextualist position. Functional contextualism (FC) is a philosophy of science that underlies modern behavioural psychology (Fox, 2008). Developed using principles of behavioural analysis, FC assumes that all behaviours occur in a context, and have a function (Hayes, Strosahl, & Wilson, 2012). For example, a thought can be either 'normal' or 'problematic' according to the context in which it occurs. Hence, thoughts are behaviours that serve a function/purpose in the current context. From a FC perspective, thoughts are not considered to be rational or irrational; or result in an emotional response (Ciarrochi, Robb, & Godsell, 2005). Therefore, it is the context that behaviours (such as thoughts) occur in that is the target of investigation and concern; in order to develop a greater understanding of the current and historical contexts in which behaviour evolves (Fox, 2008), with the goal of generating general rules for predicting and/or influencing psychological events with precision, scope, and depth (Biglan & Hayes, 1996).

FCs principal concern is the functional relationship between psychological events, and (manipulable) events in the individual's environment (Fox, 2008). Hence, research from this perspective, seeks to identify which elements of an individual's environment influence psychological events (both private and overt). In order to achieve this goal, it is necessary to systematically manipulate contextual variables, and measure the subsequent impact on the psychological event of interest (Biglan, 2011). Thus, correlational or descriptive methodologies are not appropriate as they do not isolate *which* contextual features influence change (Fox, 2008). Group comparison and single-case experimental designs, however, are favoured from this perspective, due to their use in suggesting which independent (contextual) variables may influence events of interest (Fox, 2008). Although qualitative methodologies may also be conducted within a FC framework, such methodologies are not considered as effective as experimental procedures in investigating the influence of contextual change on behaviour (Fox, 2008).

Single-case experimental designs have been traditionally employed within behavioural and contextual science, especially when investigating outcomes and processes of psychological interventions (Smith, 2012).

2.2.2 Single-Case Experimental Designs

The single-case experimental design (SCED) is an alternative method to the group comparison design (Barlow, Nock, & Hersen, 2008). The SCED is able to demonstrate the efficacy of treatments, whilst reducing the likelihood that change can be attributed to chance or confounding variables (Rassafiani & Sahaf, 2010). Moreover, the capacity of the SCED to also measure detailed time-series individual level change (Rassafiani & Sahaf, 2010), means that such a design is advantageous for addressing the aims of the current study (above

and beyond a group comparison design).

The SCED typically requires a smaller sample, compared to group comparison design, as the focus is on individual, rather than group difference. Unlike single subject research designs, SCEDs are often used to test hypotheses via the examination of a cause and effect relationship using multiple subjects (Backman, Harris, Chisholm, & Monette, 1997).

Typically, the SCED takes the form of a 'withdrawal' or ABA design, whereby a non-treatment phase (A) is proceeded by a treatment phase (B), followed by the withdrawal of the treatment and a return to a non-treatment phase (A). The ABA design is therefore used to establish a causal relationship, between an independent variable and a dependent variable. For example, if the dependent variable (e.g., child's mood) changes following the introduction of the treatment phase/independent variable (e.g., parental praise), but then returns to baseline levels once the independent variable is removed (e.g., no praise), then one can infer a causal relationship between the independent variable (parental praise) and the dependent variable (child's mood). However, such a design has both practical and ethical limitations, with regards to the testing of treatments that cannot be unlearnt (e.g., psychotherapy) and/or the removal of potentially ameliorative interventions, respectively (Rassafiani & Sahaf, 2010). Hence, the ABA design was not appropriate for use in the current study.

The multiple-baseline AB design allows for a causal relationship to be investigated, without the need for the removal of treatment, and is an ethical and practical way of examining newly developed psychotherapeutic interventions (Rassafiani & Sahaf, 2010). Similarly to the ABA design, subjects undergo a baseline/no-treatment phase prior to the introduction of the treatment phase. In a multiple-baseline design, however, the start of each participant's baseline

phase is staggered, in that no participant begins the treatment phase at the same time. This design involves the repeated measurement of the same behaviours (dependent variables) during the baseline phase, and the continued measurement of the same variables during the treatment phase. As such, each subject's baseline acts as the control phase. Hence, any observed change in the dependent variable during the treatment phase (beyond the variations observed during the baseline phase) can be attributed to the treatment. Inferences regarding treatment effectiveness are strengthened if the same change is observed across multiple-subjects. Moreover, as each participant undergoes the treatment at a different time, this reduces threats to internal validity, such as maturation or history effects (Barlow, Nock, & Hersen, 2008).

As (1) participants came forward to take part in the current study at different times, (2) the treatment could not be removed, and (3) the principal aim of the research was to determine the effects of a staggered ACT intervention on multiple measures, a multiple-baseline SCED was employed. As the intervention phase was separated into the six core ACT processes, with the introduction of a new process each week, the treatment phase was split into six different phases (see Figure 15) This allowed us to infer which ACT process or processes may result in reductions in PSA (if observed across multiple subjects).
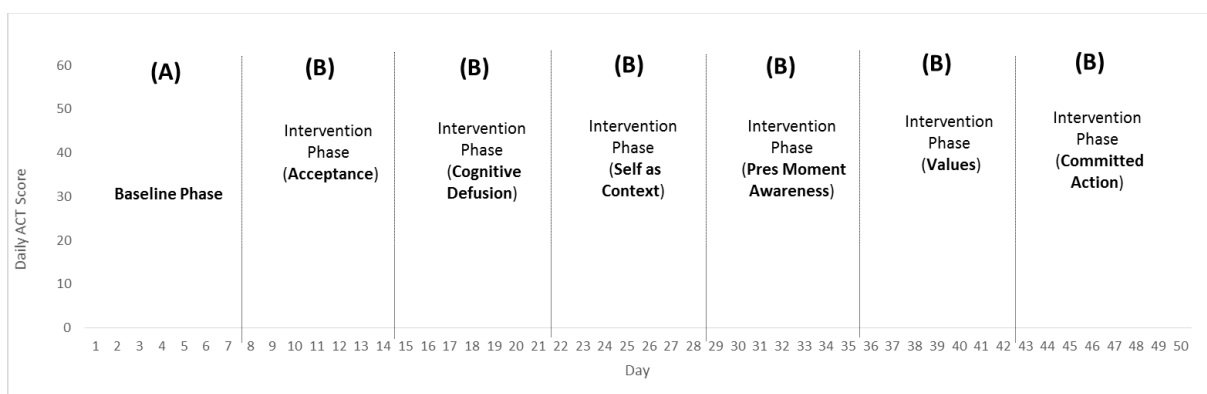

Figure 15. Multiple-baseline phases in the present study

2.3   Ethical Considerations

The procedure of the current study was designed and carried out with reference to the code of human research ethics of the British Psychological Society (BPS, 2010). Ethical approval for the present study was granted by the University of Lincoln's School of Psychology Research Ethics Committee (SOPREC; see Appendix G for the confirmation of ethical approval).

Potential participants who answered the advertisement were informed of the nature of the study, and provided with a copy of the research information sheet, via e-mail (see Appendix A). If potential participants still wished to take part in the study after reading the information sheet, then they were invited to meet the researcher to discuss the study in further detail, and ask any questions. During this meeting, prospective participants were informed that the study was experimental, hence, the ACT treatment for their PSA may not be effective.

As many individual's with PSA are likely to have wider social anxiety related difficulties (Stein et al., 1996), prospective participants were required to complete the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987) to indicate the presence of clinical levels of social anxiety. Participants who scored ≥ 95 on this scale (indicating 'severe social phobia'; Liebowitz, 1987) were encouraged to seek advice from their General Practitioner in the first instance, before agreeing to take part in the study.

Once participants understood the nature of the research, and the commitment required, they signed a written consent form (Appendix H) before beginning the baseline phase. This form was also signed by the researcher and then stored in a locked cabinet at the University of Lincoln.

To uphold participant confidentiality, each participant was assigned a randomly generated numerical identifier (using the website http://www.randomnumbergenerator.com). This number, and the participant it was linked to, was recorded and stored on a password protected memory-drive, only accessible to the researchers. These numbers were used throughout the study to identify each participant during the processes of data collection and analysis. Participants were also informed that their identity would remain confidential during the study and the dissemination phase.

Participants were provided with a unique hyperlink so they could access an online version of their daily and weekly measures (hosted on the website: www.esurv.org); the results of which were only accessible to the researchers.

Participants were made aware that their involvement in the study was voluntary, and that they had the right to withdraw at any stage without reason. Participants were compensated according to the amount of time they spent in the study (£4.00 a week, and an additional £4.00 after the successful completion of the change interview). Participants completing the whole study were therefore given £28 on completion. Participants who partially completed the study were compensated according to the time spent in the study. For example, a participant unable to compete the study after the fourth week would be given £16. Given the study's time-intensive nature, the researchers agreed that this level of payment was a fair reimbursement that was not inducement. Participants were also reminded prior to signing the consent from, and after completing the intervention phase, that participation in the in-vivo public speaking BAT was entirely voluntary, and that their choice to participate did not influence their compensation.

Participants who agreed to complete the in-vivo BAT were asked to plan a ten minute speech on a topic of their choosing, fifteen minutes prior to the beginning of the BAT. Participants were provided with a note pad on which they could make notes. Participants were also given the option of using a PowerPoint presentation. The participants were encouraged to remain in the BAT for the allotted ten minutes, however, they were informed that they could stop at any stage, by raising their right hand; at which point the researcher would thank them, and accompany them out the room. Each participant was introduced to the audience using a pre-agreed pseudonym, to maintain confidentiality.

Participants were informed that they had the right to withdraw their data from the study within two weeks of either completing, or withdrawing from participation. Participants were, however, also given the option to withdraw from the study without withdrawing their data if they wished (see appendix H). On completion of the study, each participant was given the option to receive a summary of their results and a brief interpretation if they wished.

2.4 Procedure

2.4.1 Initial Phase

Participants who satisfied the inclusion criteria, and agreed to take part in the study after reading the 'study information sheet' (Appendix A), were invited to meet with the researcher to discuss the study in detail and ask further questions. Participants who agreed to take part signed the consent from (Appendix H). They were then asked to rate a series of 28 photographs related to public speaking (Appendix I) on a scale of 0 (least anxiety provoking) to 100 (most anxiety provoking). Figure 16 displays an example of an image rated

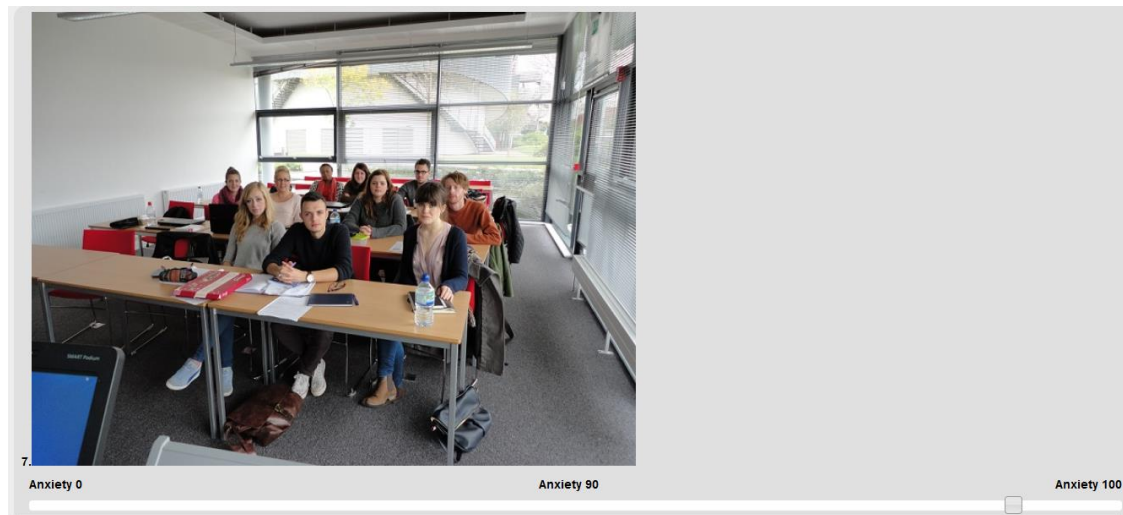by a participant. The top six most distressing photographs were used as the target stimuli in the IRAP.

Figure 16. Public speaking image and anxiety slider seen by each participant during the initial phase

Participants completed a second computerised survey regarding their most feared public speaking situation (Appendix J). This was used to create the feared scenario that respondents were asked to imagine, whilst completing the SUDS measures, during the battery, and weekly assessments. Both steps described above were taken to ensure that the IRAP and the imagined scenario (as measured using the SUDS) presented stimuli that reflected each participant's idiosyncratic PSA fears.

The participant then completed the pre-intervention battery of measures[13]. Each participant completed these measures on a laptop provided by the researcher, and was instructed to answer each question carefully. No time limit was given in which to complete the battery.

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[13] Please see the main article for a description of all the measures discussed.

2.4.2 IRAP Procedure

On completion of the self-reported measures, the participant was then asked to complete the IRAP, on the laptop provided. Instructions on how the participant should respond were provided on screen. Participants were required to respond in a manner alternately consistent (Figure 17) and inconsistent, with their fear of public speaking (Figure 18), as quickly and accurately as possible on two practice blocks. During the practice blocks (and subsequent test blocks) the participant was shown an image, and then instructed to answer *true* or *false* to each statement presented with the image, by pressing the computer key *d* or *k* respectively (see Figure 19 for an example).
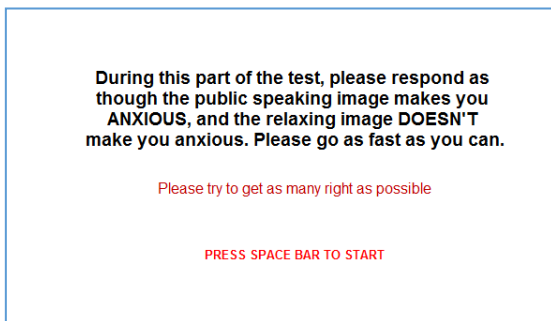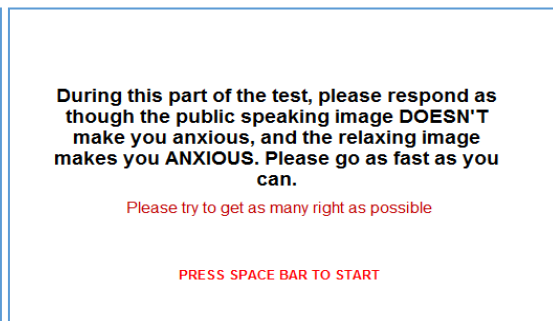

During this part of the test, please respond as though the public speaking image makes you ANXIOUS, and the relaxing image DOESN'T make you anxious. Please go as fast as you can.

Please try to get as many right as possible

PRESS SPACE BAR TO START

During this part of the test, please respond as though the public speaking image DOESN'T make you anxious, and the relaxing image makes you ANXIOUS. Please go as fast as you can.

Please try to get as many right as possible

PRESS SPACE BAR TO START

Figure 17. Consistent trial   *Figure 18.* Inconsistent trial

makes me ANXIOUS

PRESS 'd' FOR
True

PRESS 'k' FOR
False

Figure 19. Example of an IRAP image, statement, and the answer options

On completion of the practice blocks (a block is a consistent trial and an inconsistent trial), the participant began four test blocks.

If the participant answered correctly according to the trial type (e.g., consistent trial - public speaking image "makes me anxious" = True) then the next image and statement were presented. If they answered incorrectly according to the trial type (e.g., consistent trial – public speaking image "makes me anxious" = False), then a red 'X' appeared on screen (see Figure 20) until the correct answer was provided, at which point the next image and statement were presented.

Figure 20. Example of an incorrect response indication

Participants were also asked to respond to non-public speaking related stimuli (relaxing images; Figure 21) during all trial blocks. The Image types and statements were randomly presented.

Figure 21. 'Relaxing image' trial type example

Figure 22 displays an example of the four different image types (public speaking image and relaxing image) and statements ("DOESN'T make me anxious" and "makes me ANXIOUS" that were presented during the IRAP.

Figure 22. Example of the four trial types

Each participant was required to complete each trial, within each block, to a minimum standard (at least 75% correct and a median response time less than 2500 milliseconds) in order for appropriate data to be collected for analysis. As such, if the participant did not meet this minimum standard, they were informed of this minimum requirement on-screen and instructed to complete the blocks again (Figure 23).
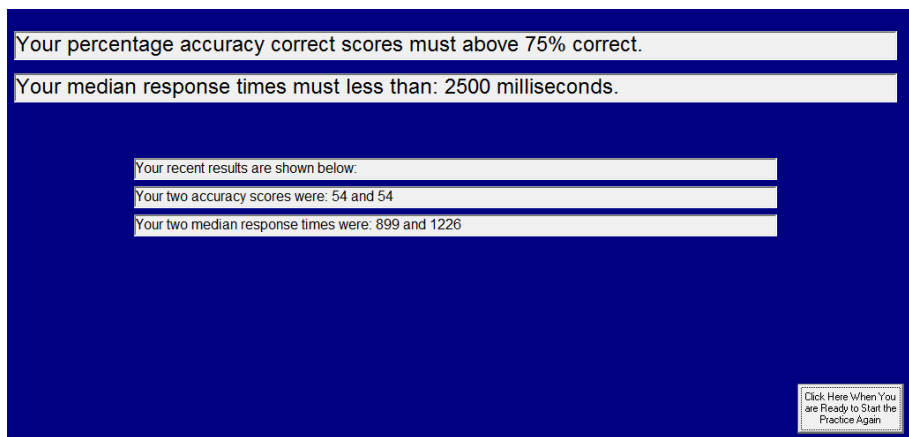

Your percentage accuracy correct scores must above 75% correct.

Your median response times must less than: 2500 milliseconds.

Your recent results are shown below:
Your two accuracy scores were: 54 and 54
Your two median response times were: 899 and 1226

Click Here When You are Ready to Start the Practice Again

Figure 23. Screen presented to participants to remind them of the minimum accuracy and speed requirements for successful completion

The participant continued to complete the test blocks until they achieved this minimum standard on all four trial types, at which point a message appeared on screen asking the participant to notify the researcher.

2.4.3 Baseline Phase

Each participant was then asked to complete the daily measure for a week. Participants were provided with a website link via their e-mail address where they could access this electronic questionnaire. All self-reported measures used in the study were created using the website: *www.esurv.org*.

After completing the daily measure for a week, each participant's response was graphed and visually analysed. If these data indicated a stable or declining trend (indicating decreasing psychological flexibility) on at least five consecutive data-points, then the participant began the intervention phase. If an upward trend appeared (indicating an increase in psychological flexibility), then the participant was asked to continue completing the daily measure until a stable or declining trend was achieved, on at least five consecutive data-points. A minimum of five observations is often used in SCED baseline periods to ensure enough data is gathered to determine the presence of 'stable behaviour' (Morgan & Morgan, 2008), and to exclude 'day to day' changes (Backman et al., 1997).

2.4.4 Intervention Phase

Once a stable baseline was achieved, each participant was provided with the introductory chapters to ACT, and the chapters related to the concept of (1) *Acceptance* from the self-help workbook, *Get out of Your Mind and Into Your Life* (Hayes & Smith, 2005). They were instructed to read these chapters over the course of a week. A suitable time each week was arranged for the researcher to contact the participant via telephone, so therapist support could be provided. At the end of each week, participants were instructed to complete the weekly measures. Again, each participant was provided with a hyperlink so they could access the weekly measure on their computer or smart-phone. At the end of the first week, participants were provided with the next set of chapters pertaining to the next ACT concept, (2) *cognitive defusion*. This process was repeated for six weeks, which allowed each participant to complete the workbook in a systematic fashion, one core ACT process at a time. Hence, each participant completed further chapters related to (3) *self-as-context*, (4) *present-moment awareness*, (5) *values*, and (6) *committed*

action over the course of six weeks. The book was split in this way so the participants could not read ahead, thus ensuring each week measured a separate ACT process. As the participants completed the workbook at different times, arranging the book in this manner allowed for stronger inferences to be made regarding the influence that the workbook had on any recorded change, and the possible mechanisms responsible. For example, if the majority of the participants' distress related to public speaking reduced during week two of the intervention, then it can be inferred that this was likely to have occurred due to the ACT process of *cognitive de-fusion* rather than other extraneous variables (as no participant completed this section at the same time).

Each participant met with the researcher to complete the mid-battery of tests, including the IRAP, after three weeks (after completing the *self-as-context* chapters), and again at the end of the intervention, after six weeks (after completing the *committed action* chapters).

2.4.5 Post-Intervention Phase and Behavioural Assessment Task (BAT)

After the final battery of tests, each participant was asked if they were willing to complete a live public speaking task in front of an assembled audience of clinical psychologists and trainee clinical psychologists, for a maximum of 10 minutes on a topic chosen on the day of the task. If the participant agreed, then a suitable date was arranged (this date was around one month after completion of the intervention stage, to allow a volunteer audience to be assembled, and a venue at the University of Lincoln to be arranged). If the participant chose not to take part in the BAT, then they were thanked, and the final change interview was arranged (see section 2.4.6 below).

Those who chose to complete the BAT were given 15 minutes prior to the talk, in which to plan their speech, using notes if they wished. They were instructed to deliver a speech on a topic of their choosing for a maximum of 10 minutes, and were encouraged to continue until this time was up. However, each participant was also instructed to raise their hand and look at the researcher, if they wished to stop the talk at any stage prior to this. If they did so, the researcher thanked them, and accompanied them out the room. During the speech, six audience members were chosen at random to complete an adapted version of the Social Performance Rating Scale (SPRS; Harb, Eng, Zaider, & Heimberg, 2003). The SPRS is an observer rated assessment of social and speech anxiety (Fydrich, Chambless, Perry, Buergener, & Beazley, 1998). This measure has demonstrated good interrater reliability (.93), internal consistency (.72), and convergent validity (.55-.65) (Fydrich et al., 1998), and has been validated for use as an assessment tool for PSA (Harb et al., 2003).

Observers rated the participant's speech performance on a scale of 0 (very poor) to 5 (very good) on their gaze, vocal quality, length of speech (e.g., concise and detailed sentences), and level of comfort (rated from 0 – very uncomfortable to 5 – very comfortable). The fifth scale, 'conversation' was omitted as this related to dyadic speeches. On average, there were 10 people in the audience during the BATs. Each participant's total speech length was also recorded.

2.4.6 Change Interview

All participants completed a change interview (Elliott, Slatick, & Urman, 2001) after the intervention phase. Those who chose to complete the BAT, were interviewed after its completion. Those who did not, were interviewed around one-month after completion of the workbook. This change interview was conducted by an independent researcher (a trainee clinical psychologist) blind to the participants'

scores on all measures. The interview was structured and completed within the framework of Elliott and colleauges' (2001) change interview protocol. Essentially, this change interview format allows those who have undergone psychotherapy to provide qualitative information on which elements of the therapy they found helpful or important, what changes they attribute to the psychological intervention, and what 'extra-therapy' factors may have resulted in any perceived change (Robert Elliott, 2010). In the current study, the findings from this change interview were used to support or refute any inferences made following the analysis of quantitative data (see Appendix F for the change interview questions). Following the change interview, participants were thanked for their time, and provided with payment for taking part (£28 in total).

2.5   Determining Reliable and Clinically Significant Change

Jacobson and Truax (1991) suggested two methods for determining whether an individual experiences meaningful change following a psychotherapeutic intervention: whether they experienced (1) Reliable Change (RC) and whether this change was a (2) Clinically Significant Change (CSC).

2.5.1 Reliable Change (RC) or Reliable Change Index (RCI)

The reliable change index (RCI) is a statistic used to determine whether the change in an individual's psychometric score (from pre- to post-intervention) is statistically significant. The RCI is defined as the change in an individual's score, divided by the 'standard error' of the difference for the test being used. This indicates the number an individual's score must increase or decrease by (dependent on the direction of improvement demarcated by the test) in order for change to be attributed to reasons other than chance (at 95% confidence) (Jacobson & Truax, 1991).

The RCI value is the individual's pre-intervention score (x^1), minus their post intervention score (x^2), divided by the standard error of the difference (^sdiff) of the test (calculated using the standard deviation of the test-takers scores, and the internal consistency of the measure) (Figure 24).

$$RCI = \frac{x^1 - x^2}{^sdiff}$$

Figure 24. RCI calculation (Jacobson & Truax, 1991)

Hence, if the difference between an individual's pre-treatment score (e.g., 57), and post-treatment score (e.g., 28) is equal to, or greater than the RCI value (e.g., 12.74), then the individual is classed as having made a reliable change at 95% confidence (Jacobson & Truax, 1991). However, if this difference is less than the RCI value, the individual is said to have not made a reliable change (Jacobson & Truax, 1991).

The Standard error of difference is calculated by initially calculating the standard error of measurement (*SEM)*. The formulation for the SEM is: the standard deviation of the test takers' scores (SD), multiplied by the square-root (1 minus the coefficient of reliability [*r]*) (Figure 25).

$$SEM = SD \sqrt{(1 - r)}$$

Figure 25. Standard error of measurement formula

This allows for the standard error of difference to be calculated (^sdiff) using the following formula (Figure 26).

$$^{s}diff = \sqrt{2(SEM)^2}$$

Figure 26. Standard error of difference formula

2.5.2 Clinically Significant Change (CSC)

If an individual is observed to have made a reliable change, then their post-treatment score can be investigated to determine whether this change can be deemed as clinically significant.

Jacobson and Truax (1991) proposed that this can be done using one of the following three criteria:

Criterion a – CSC is achieved if the individual's post-treatment score is *more than* two standard deviations from the mean score of a *clinical* group.

Or

Criterion b – CSC is achieved if the individual's post-treatment score is *within* two standard deviations of the mean score of a *non-clinical* group.

Or

Criterion c – CSC is achieved if the individual's post-treatment score is closer to the mean of the non-clinical group than the clinical group.

Figure 27 displays Jacobson and Truax's (1991) three suggested cut-off points (a, b, and c) for CSC in a graphed format.
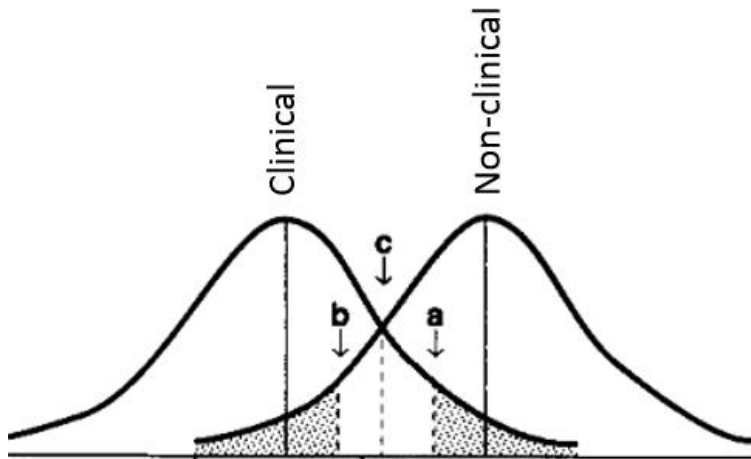
Figure 27. Jacobson and Truax's (1991) three CSC criteria

2.5.3 Critique of the RCI and CSC Method

Although the use of the RCI and CSC method allows an individual's treatment response to be investigated; something that is often neglected when using between group pre to post designs (where group scores rather than individual scores are analysed; Wise, 2004), using such criteria to determine reliable and significant change has received criticism.

Kazdin (2001) argued that symptom change may not be the 'gold standard' for assessing meaningful change, and improvements in criteria such as quality or life, or impact on others should be considered. Kazdin (2001) also suggested that it is hard to prove that passing from one group (clinical) to another (normative) results in a change in daily functioning, or that a failure to move from one group to another, means that treatment has been unsuccessful.

The RCI method for determining reliable change may lead to the assumption that a small improvement in an individual's score (not reaching the RCI cut-off) is purely down to measurement error, when

in some cases, such a change may represent a meaningful shift (Hageman & Arrindell, 1993).

Given these criticisms, it is important to use 'real world' measures designed to assess both symptom reduction and functional ability when investigating the effects of psychotherapeutic treatments (Wise, 2004). Nevertheless, the RCI and CSC methodology has withstood rigorous debate, and demonstrates a welcomed shift from studying the general outcomes of groups, to investigating the individual change within those groups (Wise, 2004).

Considering the criticisms highlighted above, the present study investigated the effects of the ACT self-help intervention on behavioural/functional ability, as well as on symptom reduction (as measured using the RCI and CSC method), to determine whether the participants experienced significant change. This was achieved by measuring each participant's willingness to approach a public speaking task, and their performance during this task. Participants were also asked directly about the effects of the intervention on their lives as part of the final change interview. Inclusion of such functional measures was also judicial as symptom reduction is not a primary goal of ACT, but increasing valued behaviour is (Hayes, Luoma, Bond, Masuda, & Lillis, 2006).

2.5.4 Critical Discussion on the use of the RCI and CSC Method in the Present Study

As suggested by Jacobson and Truax (1991), the most accurate way in which to calculate the RCI value is to use the standard deviation of the test-takers scores, and the reliability of the measure in question. However, this raises difficulties for studies employing methodologies that do not require a high number of participants, and therefore only have a few observations (such as SCEDs). In this scenario, it is therefore advised to calculate the RCI value using data (SD and

measure reliability) reported for the same measure in a large sample, as representative to the population of interest as possible (Jacobson & Truax, 1991). Hence, in the present study, the RCI values (for the measures subjected to reliable change analysis) were calculated using the data reported in studies examining the psychometric properties of the measures in question. As the sample in the present study represented an analogous clinical PSA population, the decision was made to use the data gathered from clinical populations, rather than non-clinical populations, when calculating the RCI-values and CSC cut-off scores applied. Table 11 provides information on the studies used to calculate the RCI values and CSC cut-off scores in the present study, and the type of clinical sample used.

Table 11

Studies and the Clinical Sample Type used to Calculate the Reliable Change Index in the Present Study

Measure (construct)	Psychometric study	Clinical sample Type
SSPS-N (Speech anxiety)	Hofmann and Dibartolo (2000)	Social anxiety
PHLMS (Acceptance)	Cardaciotto et al., (2008)	Mixed mental health
CFQ (Cog fusion)	Gillanders et al., (2013)	Mixed mental health
MAAS (pres-mom-aware)	Carlson and Brown., (2005)	Cancer patients
ELS (Values/comm act)	Trompetter et al., (2013)	Chronic pain

Notes. SSPS-N; Self-statements during public speaking scale – Negative: PHLMS; Philadelphia mindfulness scale-Acceptance; CFQ: Cognitive fusion scale; MAAS: Mindfulness attention awareness scale; ELS: Engaged living scale; Cog fusion: Cognitive Fusion; Pres-mom-aware: Present-moment awareness; Values/comm act: Values and committed action

Although the clinical sample used in the SSPS-N study consisted of an equivalent sample to the one used in the present study, the clinical samples used to calculate the RCI values and CSC cut-off scores for the remaining four measures ranged from individuals diagnosed with a variety of mental health disorders (PHLMS and CFQ) to those with cancer (MAAS) or chronic pain difficulties (ELS).

Hence, one must consider how similar these sample-types are to individuals with PSA, and the implications of using clinical reference groups that may not be representative of a PSA cohort (as this may result in the use of RCI values and CSC cut-offs that are not suitable for use with a PSA sample). For example, the present-moment awareness of individual's with cancer may be lower than the present-moment awareness of individual's with PSA (pre-treatment), resulting in the use of inaccurate boundaries for determining whether the participants in the present study achieved reliable and CSC.

To investigate the homogeneity between the current sample and the clinical reference samples used to calculate the RCI values and CSC cut-off scores, the mean pre-treatment scores of the participants in the present study were compared to the mean scores of the clinical reference groups on all measures that were subjected to RCI and CSC analysis (see Table 12).

Table 12

The Mean Pre-treatment Scores of the Present Study's Sample and the Mean Scores of the Clinical Reference Samples used to Calculate Reliable and Clinically Significant Change

Measure	Mean (SD) pre-treatment score of the study sample	Mean (SD) score of clinical reference sample
SSPS-N	16 (4.9)	12.3 (6.3)
PHLMS	21.8 (7.78)	24.62 (5.48)
CFQ	37.7 (7.74)	34.3 (8.06)
MAAS	3.4 (0.74)	4.08 (0.74)
ELS	51.3 (6.22)	50.90 (9.81)

Notes. SSPS-N; Self-statements during public speaking scale – Negative: PHLMS; Philadelphia mindfulness scale-Acceptance; CFQ: Cognitive fusion scale; MAAS: Mindfulness attention awareness scale; ELS: Engaged living scale

Table 9 indicates a degree of homogeneity between the current sample and the clinical samples, as the current study sample's mean pre-treatment scores were within one standard deviation of the mean scores of the clinical reference group on all measures. However, the mean pre-treatment scores of the sample in the present study were higher on the SSPS-N, the CFQ, and the ELS; and lower on the PHLMS, and the MAAS, than the scores of the clinical reference group on the same measures. This indicates that (on average) the sample used in the present study had higher levels of PSA, were more cognitively fused, were less mindful and had lower levels of acceptance, but were slightly more engaged with their values at pre-treatment than the clinical reference sample.

Using the previous example of present-moment awareness, although the RCI value is the same whichever reference group is used (study sample or clinical reference sample; RCI value = .74), the CSC cut-

off differs according to which sample is used (study sample = CSC cut-off score of 3.91 vs. clinical reference group sample = CSC cut-off score of 4.26). Hence, on this measure (MAAS), the participants in the present study were required to reach a score of ≥ 4.26 to achieve a CSC, which may be considered too high when considering the CSC cut-off score would have been 3.91 had the present study's sample been used to calculate this cut-off rather than a clinical reference group (as advised by Jacobson and Truax, 1991).

Considering this difference between the samples, and the critique of the RCI and CSC methodology, it is recommended that other factors should be considered when determining whether treatment has resulted in a meaningful change for the individual (Wise, 2004). Hence, the present study also considered changes on individualised measures (such as the SUDS), responses to an implicit measure, a behavioural assessment task, and participants' responses to the change interview, when making inferences regarding the effectiveness of ACT to treat PSA.

3. Extended Results

3.1 Effects on Positive Self-Statements during Public Speaking

Further analysis were conducted on the SSPS-Positive (SSPS-P; Hofmann & Dibartolo, 2000) to investigate the effect the intervention had on positive self-statements related to public speaking. As such, Jacobson and Truax's (1991) RCI and CSC method were used to determine which participant's SSPS-P scores were ≥ the RCI value (7.44), and the CSC cut-off (14.78) (see Table 13).

Table 13

Scores on the SPSS-P at Baseline, Mid, and Post-intervention, and Indication of Reliable and Clinically Significant Changes

Participant	SSPS-P Pre-score	SSPS-P Mid-score	SSPS-P Post-score
P1	8	15	17[R↑, C↑]
P2	4	3	7
P3	13	13	17
P4	10	14	21[R↑, C↑]
P5	13	13	12
P6	7	9	8

Note. SSPS-N: Self-statements during public speaking scale – Negative
[R] denotes Reliable Change at *p*<.05; [C] denotes Clinically Significant Change (from clinical to non-clinical range); ↓/↑ indicates directionality of Reliable or Clinically Significant Changes

Five participants reported an increase in positive self-statements associated with public speaking, with the exception of P5. Reliable and clinically significant changes were observed in two cases (P1 and P4). P3's final score was not deemed clinically significant, as reliable change had not taken place (see figure 28).
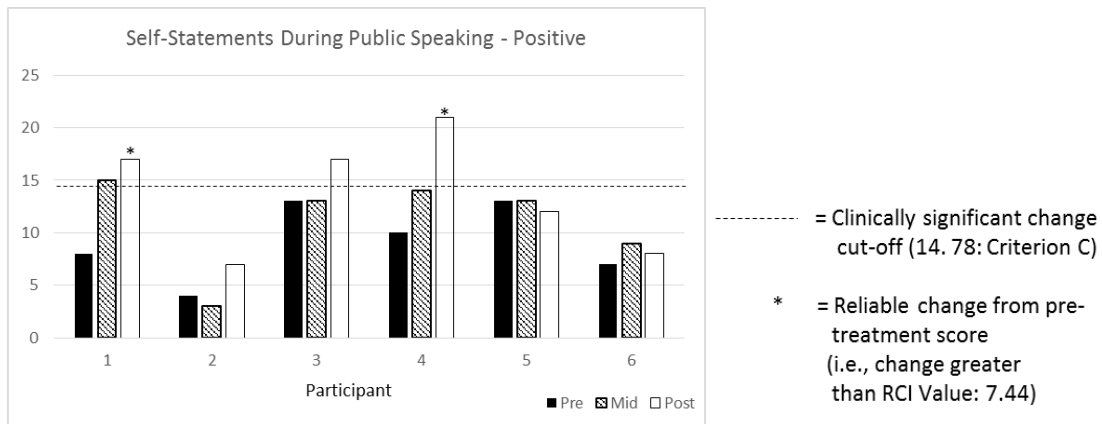
Figure 28. Scores on the SSPS-P outcome measure at baseline, mid-, and post-intervention

P1 and P4 also recorded reliable, and clinically significant reductions in negative self-statements during public speaking, as measured by the SSPS-N. Moreover, P5 also reported the least change on the SSPS-N, suggesting those who experienced a reduction in negative self-statements, also experienced an increase in positive cognitions associated with public speaking over the course of the intervention.

3.2 Analysis of the Weekly PSA measure (SSPS-N)

To determine at which point changes occurred in PSA during the intervention, participants' weekly responses to the SSPS-N were graphed. The data were inspected for reliable (RCI) and clinically significant changes (CSC; criterion c), according to Jacobson and Truax's (1991) methodology.

Figure 29 displays the weekly responses on the primary measure of PSA (Self-statements during Public Speaking Scale – Negative; SSPS-N) for each participant.
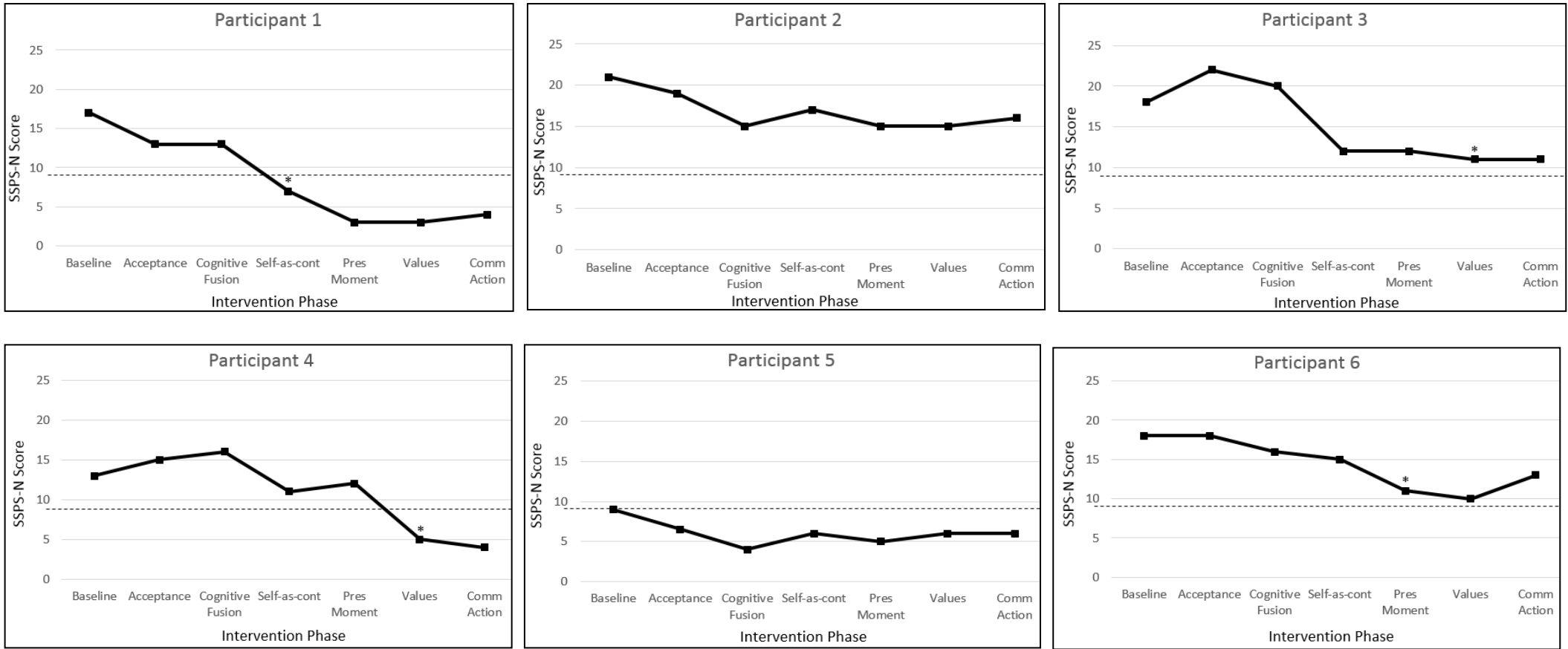
Notes: Self-statements During Public Speaking – Negative Score: SSPS-N Score; Present-moment awareness: Pres Moment; Committed Action: Comm Action; * = Reliable change from pre-treatment score (i.e., change greater than RCI Value: 6.53); -------- = Clinically significant change cut-off (criterion c)

Figure 29. Weekly responses to the SSPS-N for each participant according to intervention phase

Four participants recorded a reliable reduction in negative self-statements associated with public speaking; P1 following the third week (self-as-context phase), P6 following the fourth week (present-moment awareness phase), and P3 and P4 following the fifth week (values phase). P1 and P4's scores also reached clinical significance at the point of reliable change. P2 and P5 did not report any reliable reductions on this measure at any stage.

3.3 Analysis of weekly responses to the imagined public speaking Scenario (distress, avoidance, and willingness to approach)

To investigate the point at which change occurred in levels of distress, avoidance, and willingness associated with the imagined public speaking scenario, each participant's weekly responses to the SUDS measure were graphed. As RCI and CSC values are not available for the SUDS, the graphs were visually analysed (for point of change/drop in score).

3.3.1 Distress

Figure 30 displays each participant's weekly level of distress related to their feared imagined public speaking scenario, as measured by the SUDS-D, over the course of the intervention.

Figure 30. Weekly levels of distress (SUDS-D) associated with the imagined public speaking task for each participant according to intervention phase
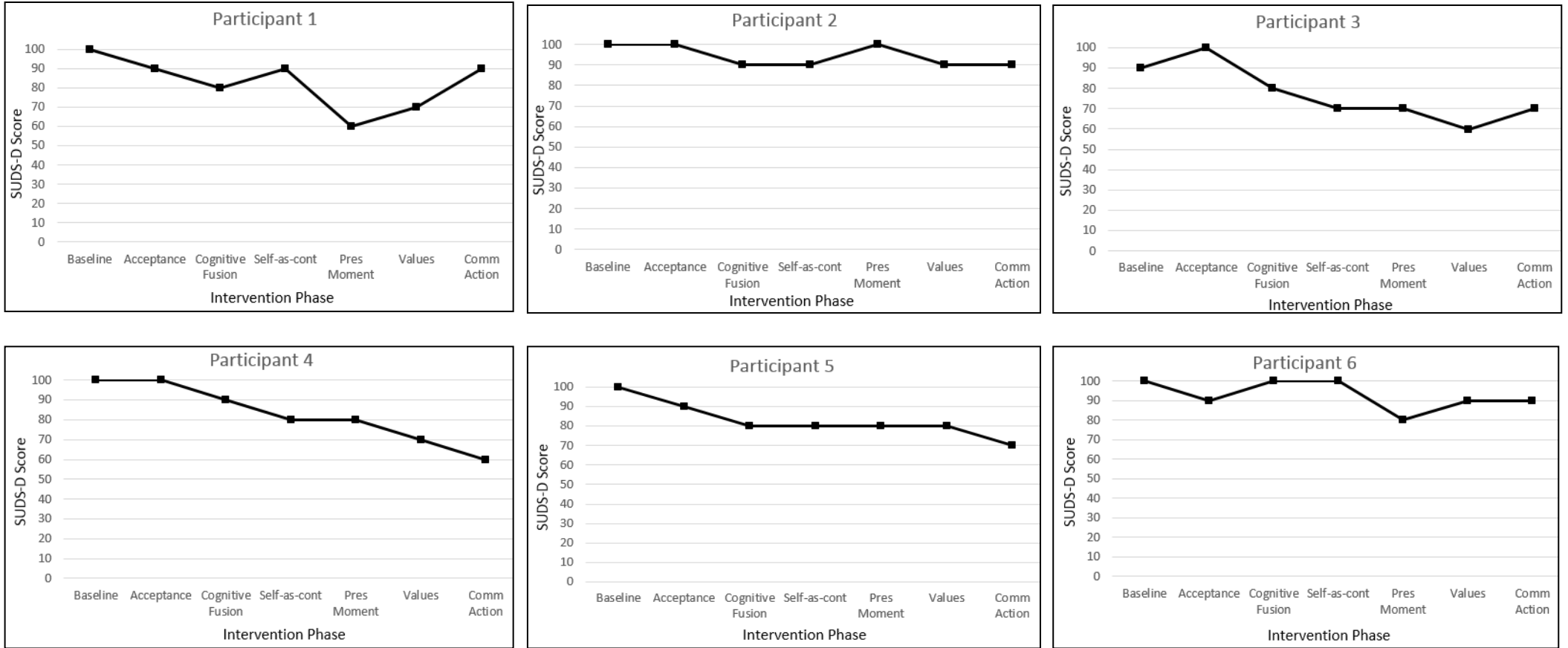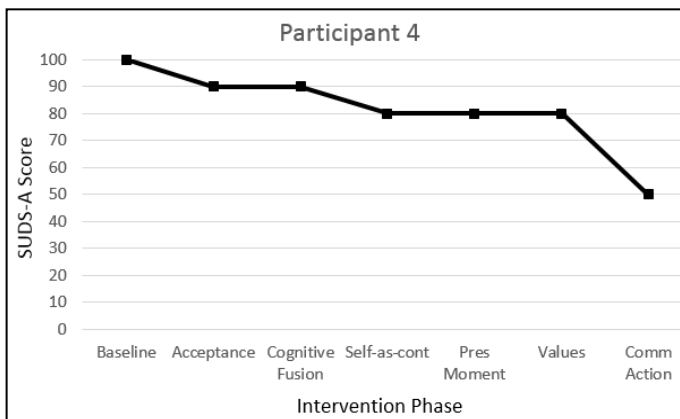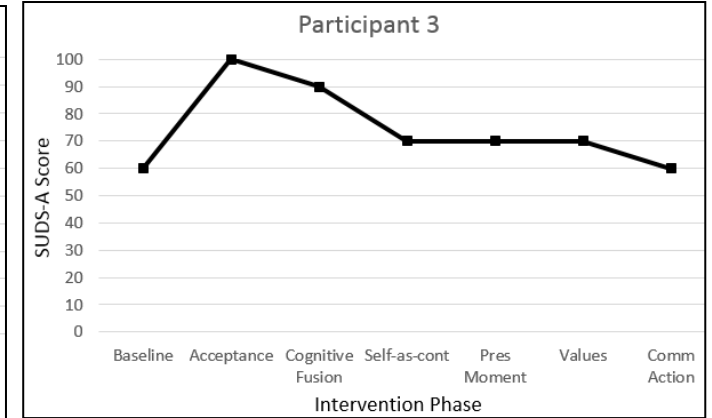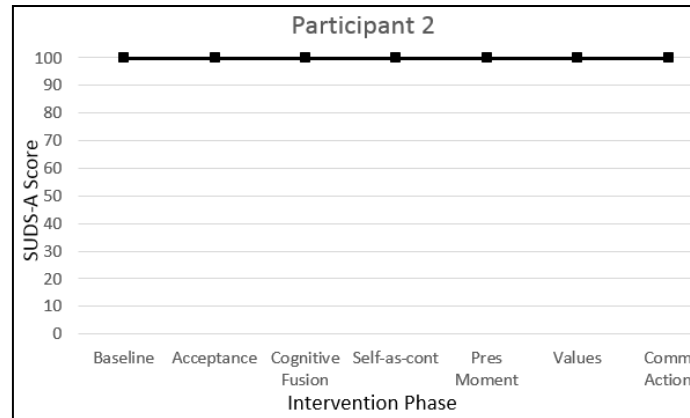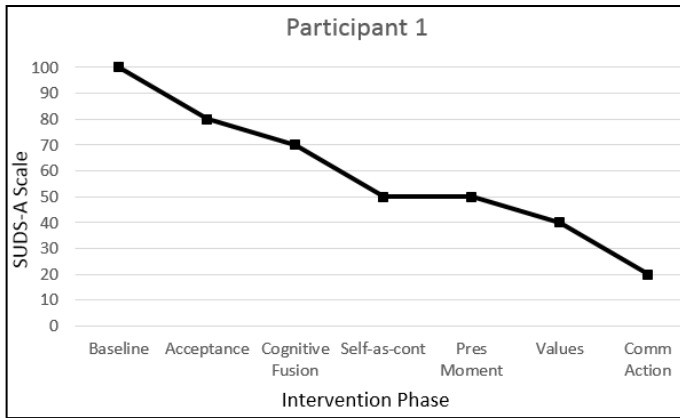
Notes: Subjective Units of Distress Scale Score: SUDS-D Score; Present-moment awareness: Pres Moment; Committed Action: Comm Action

P1 and P6 reported the greatest drop in distress associated with the imagined task following the present-moment awareness week; with both cases showing an immediate increase in distress following this phase. Participants P3 and P4 reported a steady decline in distress from the point of the second week (cognitive defusion phase). P5 reported a slight reduction in distress following the first and second week (acceptance and cognitive defusion phases), and again in the final week. P2 and P6 reported little change in distress over the course of the intervention, however, P6 reported a dip in distress following the present-moment awareness phase.

3.3.2 Avoidance

Figure 31 displays each participant's weekly desire to avoid their feared imagined public speaking scenario, as measured by the SUDS-A, over the course of the intervention.
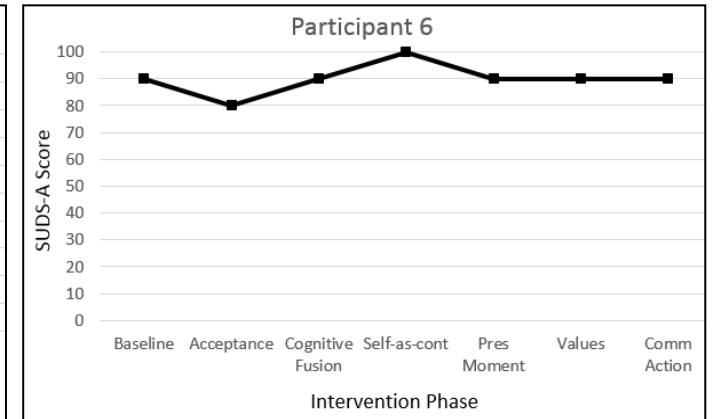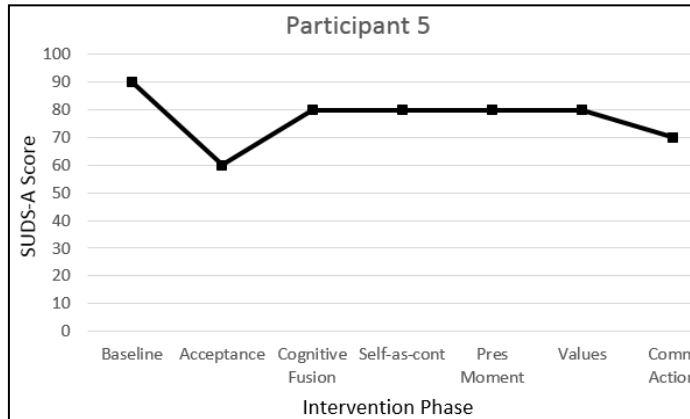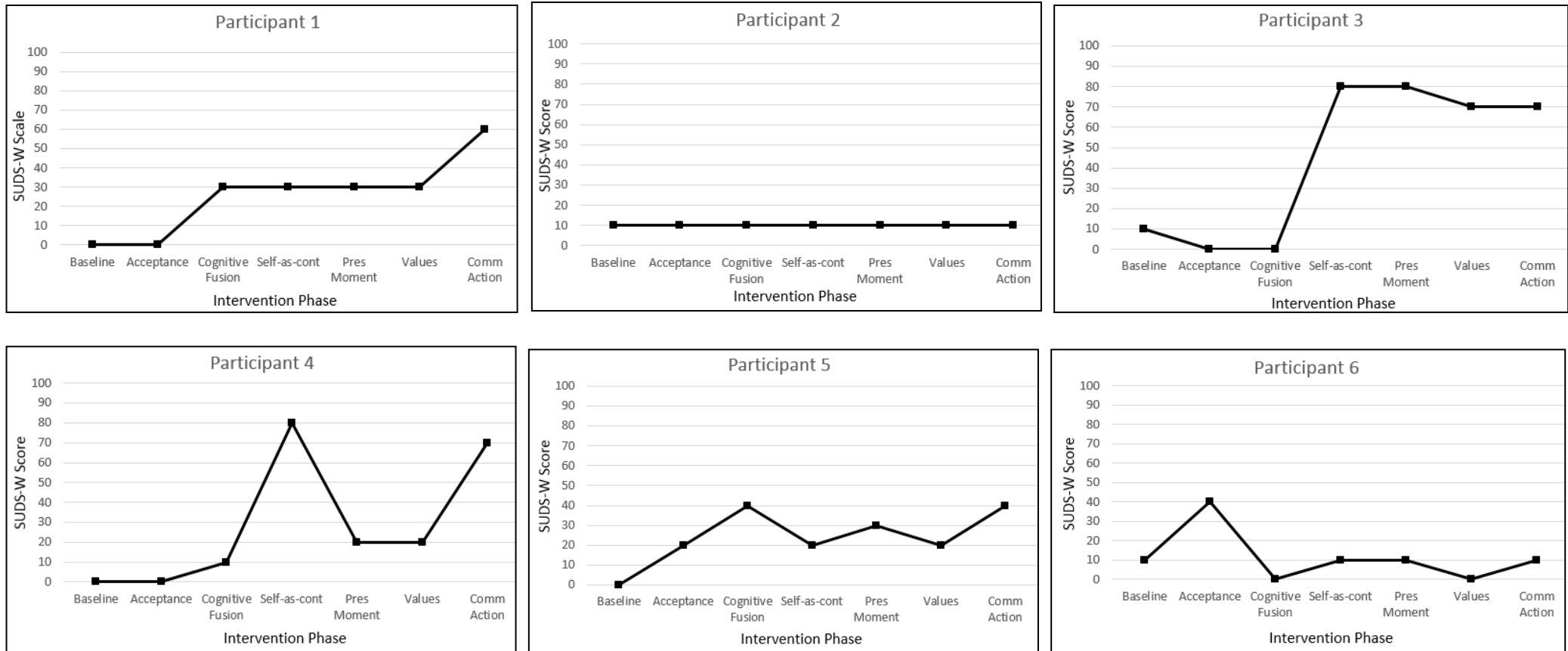
Notes: Subjective Units of Distress Scale - Avoidance Score: SUDS-D Score; Present-moment awareness: Pres Moment; Committed Action: Comm Action

Figure 31. Weekly desire to avoid (SUDS-A) the imagined public speaking task for each participant according to intervention phase

P2 and P6 reported no overall change in avoidance, however, P6 reported a slight drop in her desire to avoid the imagined scenario after the first week (acceptance), but this was soon followed by an increase during the following two weeks (cognitive fusion and self-as-context phase). P1 and P3 both reported a drop in avoidance following the self-as-context phase following week three, however, P3 reported an increase in her desire to avoid the imagined scenario following the first intervention week. P4 experienced a large reduction in avoidance following the final week of the intervention (committed action), whereas P5 reported the greatest reduction in avoidance following the first week (acceptance phase).

3.3.3 Willingness

Figure 32 displays each participant's weekly level of willingness to approach their feared imagined public speaking scenario, as measured by the SUDS-W, over the course of the intervention.

Figure 32. Weekly willingness to approach (SUDS-W) the imagined public speaking task for each participant according to intervention phase

Notes: Subjective Units of Distress Scale - Willingness Score: SUDS-W Score; Present-moment awareness: Pres Moment; Committed Action: Comm Action

Both P2 and P6 showed no overall change in willingness to approach the imagined task, however, P6 reported a decrease in levels of willingness following the second week (cognitive fusion phase), after a brief increase in the first (acceptance phase). Both P3 and P4 reported a large increase in willingness following the self-as-context phase. P5 reported small increases in willingness after the acceptance, cognitive fusion and committed action phase. P1 showed large increases in levels of willingness following the second week (cognitive fusion) and the final week (committed action) of the treatment phase.

3.4 Analysis of the Weekly ACT Process Measure

To investigate whether changes occurred in the ACT process measures concurrently with, or following, the ACT component being completed by the participant (e.g., did reliable change occur in the measure of acceptance in concordance with the acceptance component of the intervention) each participant's responses to the weekly process measure were graphed. The data were inspected for reliable (RCI) and clinically significant changes (CSC; criterion c), according to Jacobson and Truax's (1991) methodology.

3.4.1 Acceptance

Figure 33 displays each participant's weekly response on the measure of acceptance (Philadelphia Mindfulness Scale – Acceptance; PHLMS).
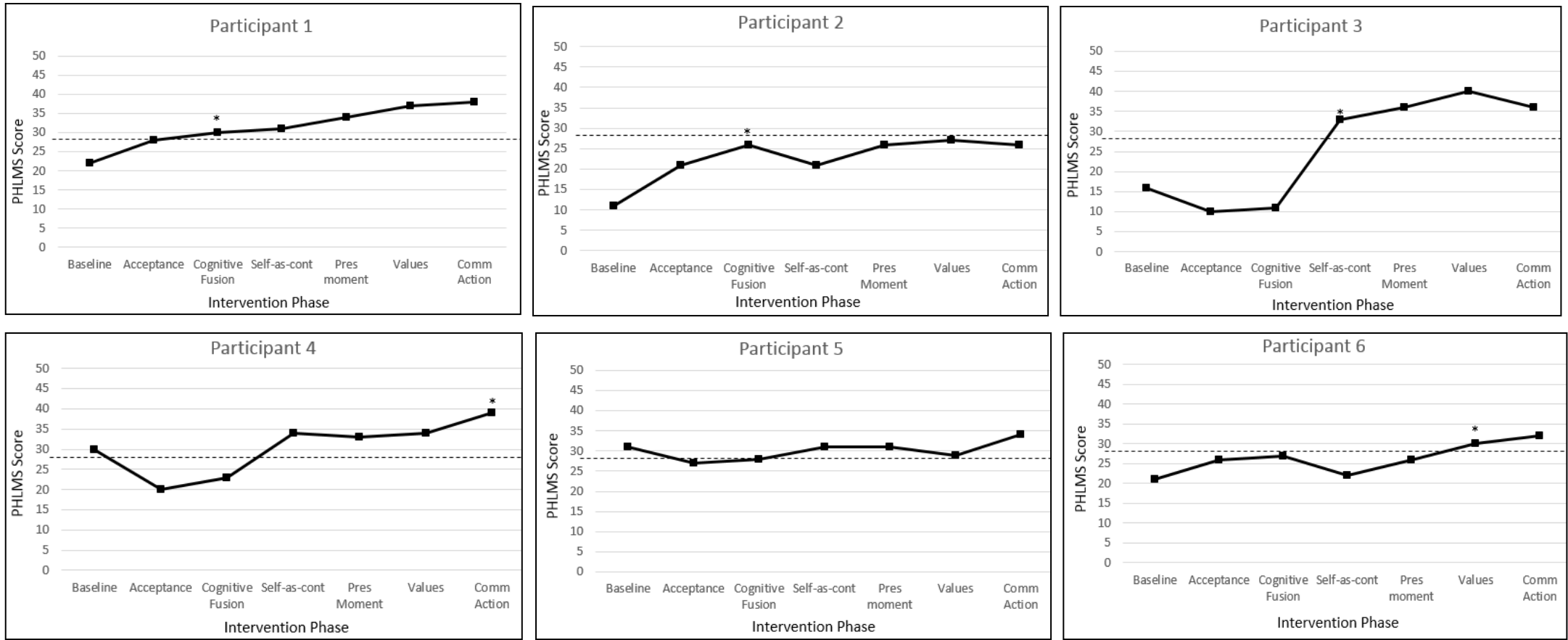
Notes: Philadelphia Mindfulness Scale (Acceptance) Score: PHLMS Score; Present-moment awareness: Pres Moment; Committed Action: Comm Action; * = Reliable change from pre-treatment score (i.e., change greater than RCI

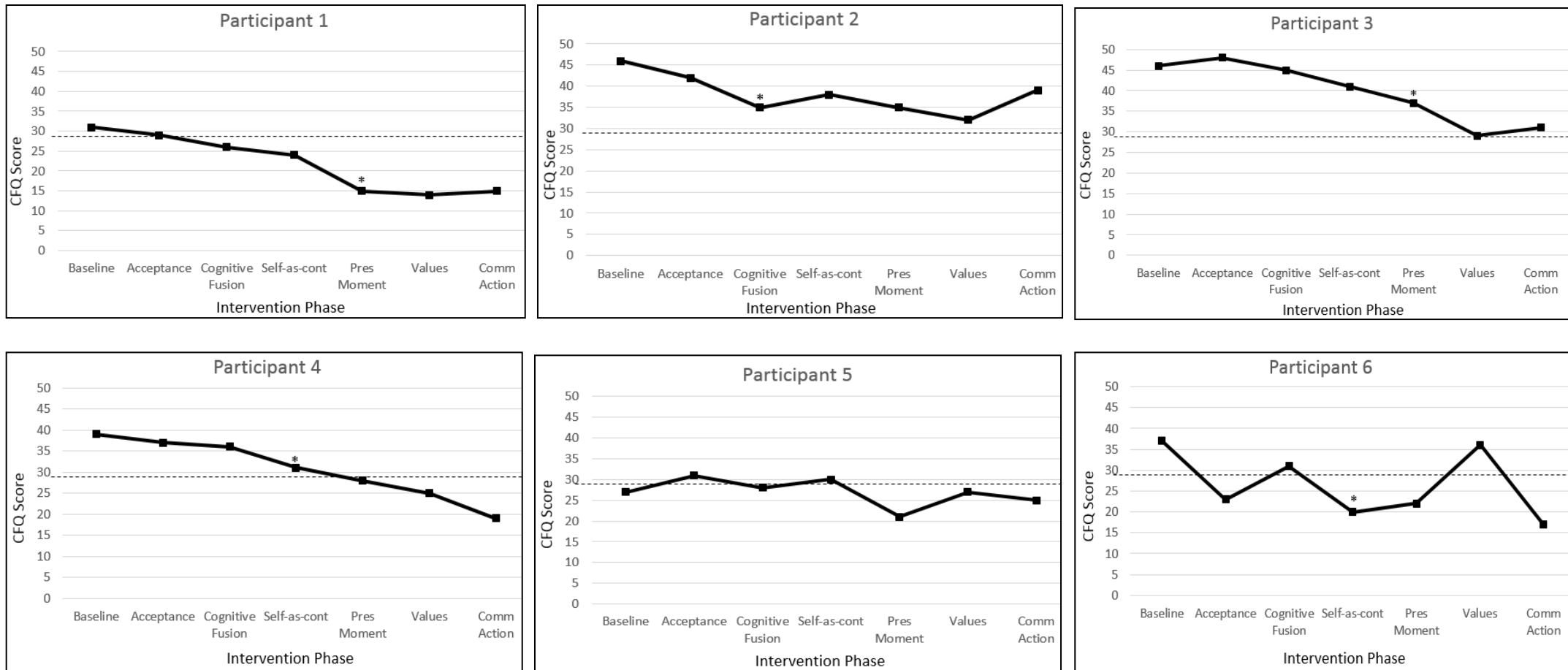Value: 7.59); --------- = Clinically significant change cut-off (criterion c).

Figure 33. Responses to the ACT process measure capturing acceptance (PHLMS) for each participant according to intervention phase

Two participants recorded a reliable increase in levels of acceptance a week after completing the acceptance intervention (during the cognitive defusion phase) (P1 and P2). One participant experienced a reliable increase in acceptance two weeks after the acceptance phase (P3; during the self-as-context phase), and two participants experienced reliable increases in acceptance either at the end of the intervention (P4; committed action phase) or during the penultimate week (P6; values phase). Change was deemed clinically significant at these points for P1, P3 and P6[14]. P5 did not achieve a reliable change at any point during the intervention.

3.4.2 Cognitive Fusion

Figure 34 displays each participant's weekly response on the measure of cognitive defusion (Cognitive Defusion Questionnaire; CFQ).

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[14] CSC was not achieved for P4 and P5 as (1) their baseline-score began above the CSC cut-off value, or (2) they did not achieve the prerequisite reliable change.

Notes: Cognitive Fusion Questionnaire Score: CFQ Score; Present-moment awareness: Pres Moment; Committed Action: Comm Action; * = Reliable change from pre-treatment score (i.e., change greater than RCI Value: 7.74);
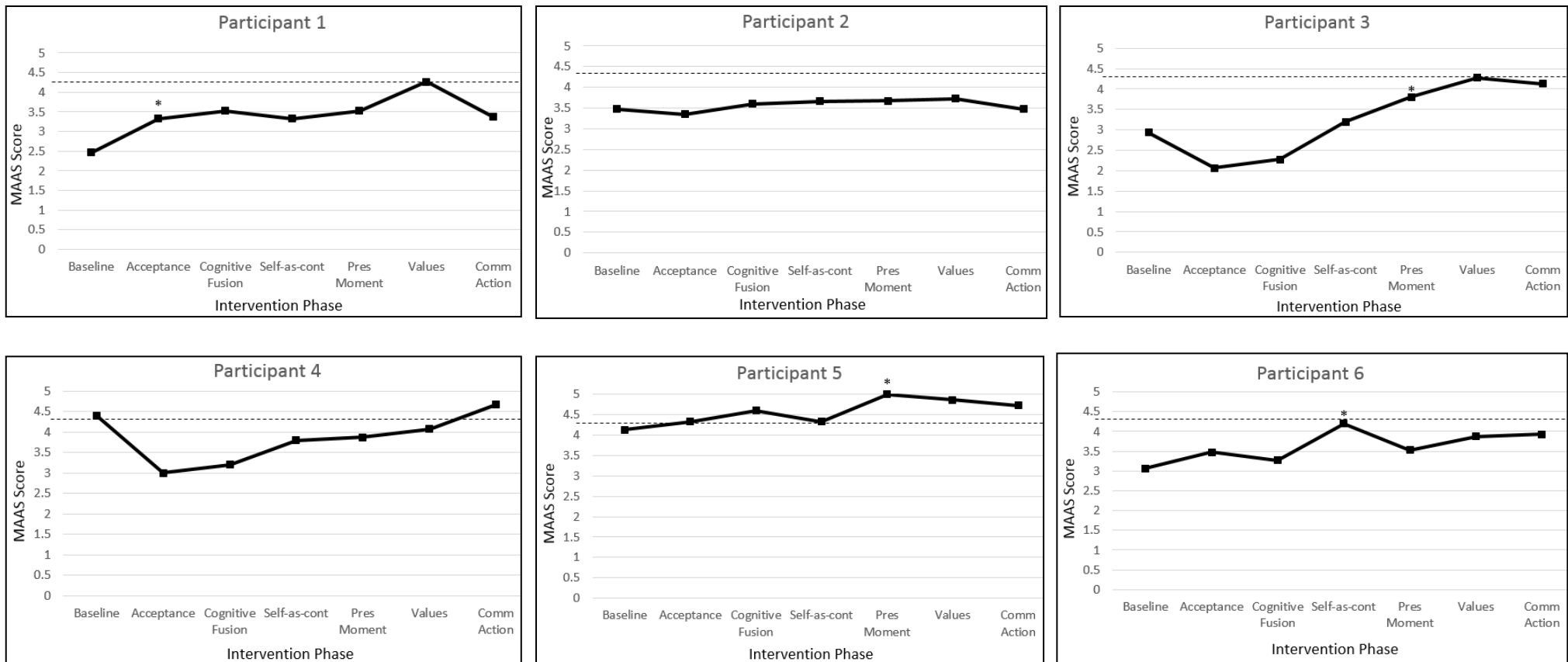
-------- = Clinically significant change cut-off (criterion c).

Figure 34. Responses to the ACT process measure capturing cognitive fusion (CFQ) for each participant according to intervention phase

One participant experienced a reliable reduction in cognitive defusion in concordance with this phase in the intervention (P2). P4 and P6 recorded reliable reductions in cognitive fusion a week following the cognitive defusion phase, whereas P1 and P3 experienced reliable reductions in cognitive fusion two weeks after this phase in the intervention (during the present-moment awareness phase). P5 did not report a reliable reduction in cognitive fusion at any stage. Change was deemed clinically significant for P1, P4 and P6.

3.4.3 Self-as-context and Present-Moment Awareness

Figure 35 displays each participant's weekly response on the measure of self-as-context and present-moment awareness (Mindful Attention Awareness Scale; MAAS).
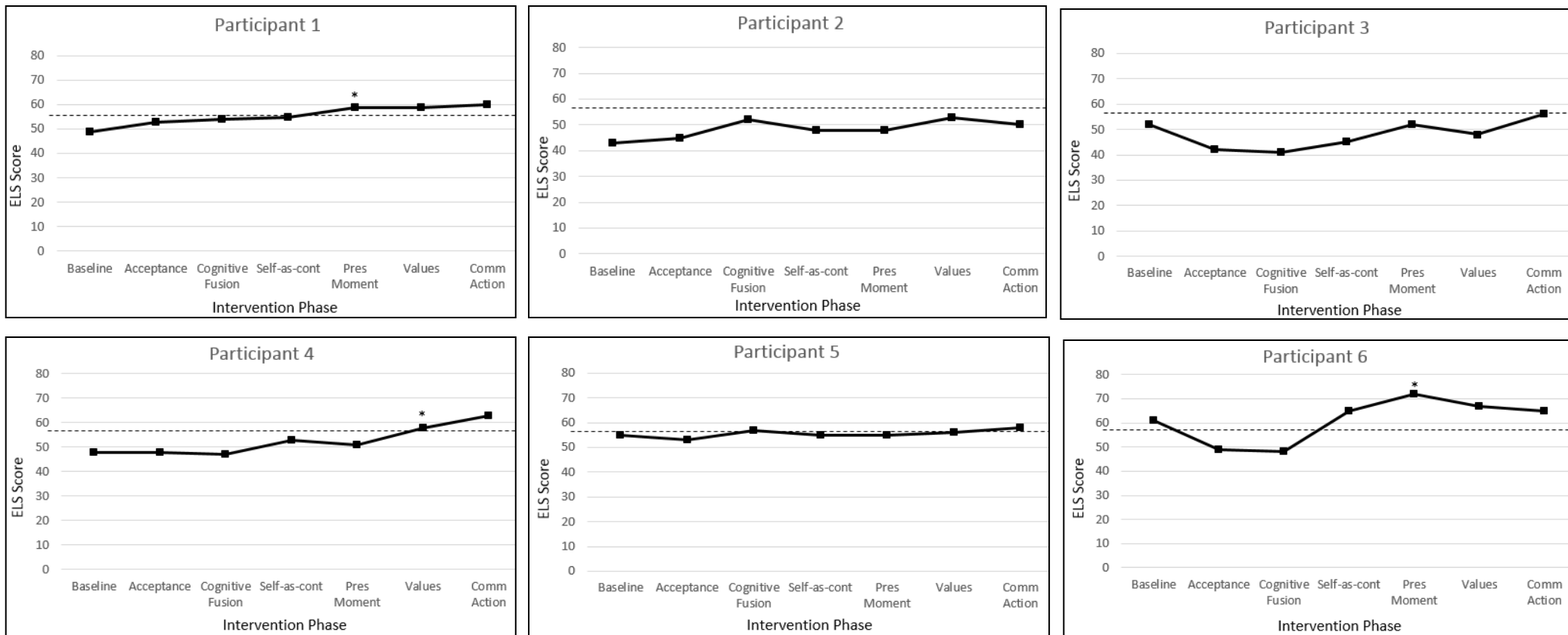
Notes: Mindful Attention Awareness Scale score: MAAS Score; Present-moment awareness: Pres Moment; Committed Action: Comm Action; * = Reliable change from pre-treatment score (i.e., change greater than RCI Value: .74);

-------- = Clinically significant change cut-off (criterion c).

Figure 35. Responses to the ACT process measure capturing self-as-context and present-moment awareness (MAAS) for each participant according to intervention phase

Three participants experienced a reliable increase in present-moment awareness in concordance with the present-moment intervention phases of either self-as-context (P6) or present-moment awareness (P3 and P5). P1 showed a reliable increase in present-moment awareness during the acceptance phase, two weeks prior to the target treatment phase, however, achieved CSC a week after the target phase (during the values phase). P2 and P4 did not experience a reliable improvement in present-moment awareness, with P4 demonstrating a reliable *reduction* in present-moment awareness during the first two weeks of intervention. P5 was the only participant to reach the CSC cut-off, and maintain this gain until the end of the intervention.

3.4.4 Values and Committed Action

Figure 36 displays each participant's weekly response on the measure of values and committed action (Engaged Living Scale; ELS).

Notes: Engaged Living Scale score: ELS Score; Present-moment awareness: Pres Moment; Committed Action: Comm Action; * = Reliable change from pre-treatment score (i.e., change greater than RCI Value: 8.16);

------- = Clinically significant change cut-off (criterion c)

Figure 36. Responses to the ACT process measure capturing values and committed action (ELS) for each participant according to intervention phase

P4 reported a reliable increase in values/committed action in concordance with the values/committed action treatment phase. P1 and P6 also reported a reliable increase, however, this occurred a week prior to the values/committed action treatment phase, during the present-moment awareness phase. P2, P3 and P5 did not report a reliable increase in values/committed action at any stage. P1 and P4's scores reached clinical significance.

3.5   Overall Synthesis

Reliable change in target ACT processes occurred either in concordance with, or proceeded, the respective intervention phase for all but one participant (P5), during the first and second treatment phases (acceptance, and cognitive fusion).

During the third and fourth treatment phases, related to the ACT processes of present-moment awareness (self-as-context and present-moment awareness), three participant's recorded reliable improvements immediately after the treatment phase in the target measure (P3, P5 and P6). P1 also showed a reliable improvement in present-moment awareness, however, this occurred a week before this treatment phase. P2 and P4 made no reliable improvement in present-moment awareness during, or after, this treatment phase. Present-moment awareness was the only ACT process that showed a reliable improvement for P5 throughout the whole intervention phase.

P4 was the only participant to record a reliable increase in values/committed action during the respective treatment phase. P1 and P6 recorded a reliable improvement in values/committed action, but this occurred during the previous present-moment awareness treatment phase. P2, P3 and P5 showed no reliable improvements in values/committed action during this intervention stage.

The most frequent occurrences of reliable shifts in the ACT processes (when considering *all* the ACT process measures) occurred during the present-moment awareness phase of the intervention, closely followed by the self-as-context treatment phase. This indicates that this treatment phase may also aid the development of the other four ACT processes (acceptance, cognitive defusion, values and committed action) in addition to the development of mindfulness based techniques, and that these two treatment phases were potentially the most influential ACT processes of the six during the intervention.

3.6 Summary of Results for each Participant

The following section presents a narrative synthesis of the findings for each individual participant, with reference to their results on all measures conducted during the study (please refer to the journal paper and/or the previous section for tabulated/graphed results).

3.6.1 Participant 1 (P1)

P1 reported a reliable and clinically significant reduction in negative self-statements related to public speaking after the third week of the intervention / the self-as-context phase. This reduction in PSA was preceded by an increase in willingness to approach her feared imagined public speaking scenario, and a decrease in distress and desire to avoid the same scenario. Reliable increases in the ACT process measures of acceptance, self-as-context, and present-moment awareness also took place prior to the reduction in the key measure of PSA. P1 also reported reliable and clinically significant improvements in the other ACT processes measuring cognitive fusion and values, however, these changes occurred following the fourth week (present-moment awareness phase).

P1's level of psychological flexibility remained at baseline levels for the majority of the treatment phase, however, P1 reported a slight increase in psychological flexibility during the final two phases related to values and committed action respectively. The treatment effect size (with regard to the development of psychological flexibility) was deemed to be small (.17)[15]. P1's responses to the IRAP also indicated an increase in implicit anxiety towards public speaking images/stimuli.

P1 chose to take part in the BAT and remained in the task for the majority of the allotted time (74% of the BAT time). P1's performance in the BAT was rated highly by the audience (mean observer-rated score of 4.1).

P1 reported that the present-moment awareness phase of the intervention was the most influential, that she became more accepting of her PSA, and that the change she experienced as a result of the intervention had been very personally important.

3.6.2 Participant 2 (P2)

P2 did not report a reliable reduction in negative self-statements related to public speaking during the intervention. She also reported little change in her levels of distress related to her feared imagined public speaking scenario, and no change with regards to avoidance of, or willingness to approach, the same scenario. P2 reported a reliable increase in the ACT processes of acceptance and cognitive defusion during the second week, however, this change was not deemed clinically significant, and P2's final score on the measure of cognitive defusion returned to 'unreliable' levels. No other ACT process measure reliably changed during the intervention phase for P2.

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[15] Although P1's achieved a stable baseline period of psychological flexibility, her high baseline scores suggest that either (1) the treatment had little effect on increasing P1's psychological flexibility, or (2), P1's baseline psychological flexibility may have been uncharacteristically high, and a longer baseline period may have been more appropriate to establish greater stability prior to the treatment phase.

However, P2's psychological flexibility increased following the first week of treatment, and continued to improve. As such, treatment overall (according to this measure alone) was deemed to have been highly effective (.93). P2's responses to the IRAP indicated a negligible reduction in implicit anxiety towards public speaking images/stimuli.

P2 chose not to complete the voluntary BAT. She also reported that she found the workbook "hard to grasp" and confusing at times. Additionally, P2 reported that she had a diagnosis of depression, and that she found it difficult to motivate herself to complete the workbook exercises at times. Nevertheless, P2 reported that she found the acceptance phase of the intervention the most influential, and subsequently noticed an increase in her acceptance of anxiety in general.

3.6.3 Participant 3 (P3)

P3 reported a reliable reduction in PSA (as measured by the SSPS-N) following the fifth week of the intervention (values phase); however, this change was not clinically significant. This reduction in negative self-statements associated with public speaking was preceded by a reduction in distress elicited by the imagined public speaking scenario, and an increase in willingness to approach this situation. However, no change occurred in P3s desire to avoid this situation.

This reduction in PSA was also preceded by reliable improvements in the ACT processes of acceptance, present-moment awareness, and cognitive fusion; all of which occurred during the self as context stage (acceptance) or the present-moment stage (cognitive fusion and present-moment awareness). P3 did not report a reliable increase in the values process measure.

P3 demonstrated a reduction in implicit anxiety associated with public speaking stimuli by the end of the intervention. P3 also chose to complete

the BAT, and remained in the task for the maximum allotted time. P3 was given a moderate to good observer rated score during the BAT (3.5).

P3's psychological flexibility increased following the third week (self-as-context) and continued to increase throughout the intervention. The treatment was deemed moderately effective, according to this measure (.76).

During the change interview, P3 reported that the values phase was the most influential, she noticed an increase in her acceptance of distressing private events, and she reported that this change had been important for her.

3.6.4 Participant 4 (P4)

P4 reported a reliable and clinically significant reduction in negative thoughts associated with public speaking following the fifth week of intervention (values phase). This was preceded by a reduction in P4's level of distress and avoidance caused by the imagined task, and an increase in levels of willingness to approach this task. P4 also reported a reliable and clinically significant decrease in the ACT process of cognitive fusion prior to this reduction in negative thoughts surrounding public speaking. Reliable and clinically significant increases in values/committed action took place in concordance with ameliorative reductions in PSA (as measured by the SSPS-N). A reliable increase in levels of acceptance also occurred, however, this took place a week later (during the committed action phase). P4 did not report a reliable increase in her levels of present-moment awareness at any stage.

P4's psychological flexibility increased following the first week (acceptance phase) and the third week (self-as-context); and then continued to increase throughout the intervention. The treatment was deemed highly effective, according to this measure (.95).

P4's responses on the IRAP indicated a large reduction in implicit anxiety by the end of the intervention. P4 also chose to complete the BAT, however, she spent the least time in the task of the BAT completers (31%), and received the lowest observer-rated score (3.0). Nonetheless, this score still represented a moderate performance.

P4 reported that the present-moment awareness intervention was the most influential, she experienced a reduction in her desire to avoid public speaking, and that the change she noticed had been very important to her.

3.6.5 Participant 5 (P5)

P5 reported no reliable reduction in PSA, as measured by the SSPS-N. P5 did however report an increase in his willingness to approach his feared imagined public speaking scenario, and a decrease his distress and desire to avoid the same scenario.

P5 only reported a reliable (and clinically significant) improvement in one ACT process measure; present-moment awareness. This reliable change occurred following the fourth week (present-moment awareness phase), but returned to 'unreliable' levels post intervention.

P5's responses to the IRAP indicated a slight increase in his implicit public speaking anxiety over the course of the intervention, however, P5 chose to complete the BAT and was rated as giving a near perfect performance by the audience (4.9). P5 also remaining in the task for nearly all of the allotted time (98%).

P5's daily measure indicated that his psychological flexibility increased slightly during the initial phases of the intervention, and began to accelerate during the final week (committed action phase). As such, treatment was deemed to have been moderately effective (.73) in increasing P5's psychological flexibility.

P5 reported that the present-moment awareness phase was the most influential, and that he had begun to separate himself from his unhelpful thoughts; however, he was unsure whether this change had been important to him. P5 also spoke of his difficulty in completing the exercises in the workbook, due to the demands of being a new father.

3.6.6 Participant 6 (P6)

P6 reported a reliable (but not clinically significant) reduction in the principal measure of PSA (SSPS-N) following the fourth week (present-moment awareness phase). This change was preceded by reliable improvements in the ACT processes of cognitive defusion, and self-as-context/present-moment awareness. P6 also reported a reliable improvement in values/committed action in concordance with reliable reductions in PSA, but this change returned to 'unreliable' levels post intervention. P6 also reported a reliable (and clinically significant) increase in acceptance. This reduction occurred after the fifth week of the intervention (values phase).

P6's responses to the IRAP indicated a slight increase in her implicit anxiety towards public speaking stimuli. She also chose not to take part in the final speech BAT.

P6's psychological flexibility, however, began to increase during the third week (self-as-context phase) and continued to do so throughout the intervention phase. As such, the treatment was deemed to have had a moderate effect (.81) in increasing P6's psychological flexibility.

During the final interview, P6 reported that she found the workbook hard to understand due to the "high level of theory attached to it". However, she stated that she found the present-moment awareness chapter the most influential, and stated that the intervention had reduced her anxiety; however, she found the nature of the BAT (unprepared speech) too anxiety provoking.

4. Extended Discussion

4.1 Participants Five and Six

The findings with regard to P5 and P6 are particularly interesting, given their paradoxical nature. Although P5 reported a slight increase in psychological flexibility, this increase was generally small and did not differ greatly from his baseline scores. Additionally, P5 did not report an overall lasting improvement in any of the ACT processes. P5 did report improvements on all SUDS measures (reduced distress, reduced avoidance, and increased willingness) related to the imagined public speaking task, however, he did not show a reliable reduction in PSA as measured by the SSPS-N. Overall, P5 reported the least change on the self-rated measures of any participant. Yet, he still went on to complete the BAT, and received the highest observer-rated score from the audience members compared to the other participants.

Conversely, P6 reported a much greater increase in psychological flexibility, than P5. Although her reduction in PSA, as measured by the SSPS-N, was not deemed to have reduced beyond the RCI index value, her score reduced more than P5's (however, P6 only reported an overall reduction in the SUDS measure of distress related to the imagined public speaking task). She also reported reliable improvements in three ACT processes (acceptance, cognitive defusion, and mindfulness). Her post-scores on these ACT processes were also clinically significant on two measures (acceptance and cognitive defusion). Despite these improvements in psychological flexibility, PSA and ACT processes, P6 chose not to complete the BAT.

The following section discusses these participants in further detail and offers hypotheses for these findings.

4.1.1 P5

P5 was the only male participant to take part in the study. He was also the only participant who was not a student. He was a lecturer, who engaged in public speaking around 2/3 times a week. Nevertheless, he explained when agreeing to take part in the study, that he had experienced PSA all his life, and often found himself in distress prior to, and during public speeches, both in his personal and occupational life. P5 described his most feared public speaking scenario as having to deliver an unplanned speech to a large audience of peers (fellow colleagues).

During the intervention, P5 explained that he managed to read the workbook each week, however, he struggled to complete the majority of the exercises the workbook suggested. P5 explained that he did not have the time due to his new role as a father. Over the course of the intervention, P5 reported finding the workbook easy to read, however, he stated that he felt the book catered for individuals with greater, more serious psychopathologies than PSA.

Prior to the BAT, P5 requested that the audience members consist of non-university employed staff. He explained that he felt confident to complete the BAT, however, would feel embarrassed if his fellow colleagues knew of his speech anxiety. During the BAT, P5 found the preparation stage difficult, as he had to choose the topic for the speech, rather than have one provided. P5 was not expecting this, so he spent the majority of the 15 minutes before the BAT thinking of a topic to talk about. During the BAT, P5 delivered a comprehensive speech on the anatomy of the ear to a group of trainee clinical psychologists, who rated his speech as nearly perfect (4.9) on the observer-rated measure. P5 came within seconds of reaching the maximum time allowance. During the change interview, P5 reported feeling anxious during the task, and worried whether the audience were engaged and/or cared about what he was saying.

There could be a number of hypotheses explaining why P5 took part in the BAT, even though he did not report vast reductions in PSA or shifts in ACT processes:

1. P5 may have agreed to take part in the BAT as this task may not have replicated a feared public speaking context for him, as the audience consisted of students. Given P5 reported that his most feared public speaking situation involved audience members comprising of his peers, P5 may have declined to take part in the BAT, if the audience included fellow colleagues.

2. P5 may have felt pressured to adhere to the demands of the researcher, and took on the role of 'the good-participant' (Nicholas & Maner, 2008; attempting to prove the researchers hypothesis). A characteristic that may have been strengthened by the therapeutic relationship that occurred between the researcher and P5 over the course of the six week intervention.

3. P5's participation in the BAT may have reflected his continued attempts to unsuccessfully habituate to public speaking contexts. In other words, the ACT intervention may have been unsuccessful in reducing P5's use of cognitive avoidance techniques, such that continued exposure to these situations (in P5's occupational role/ the BAT) has not led/did not lead to habituation; and perhaps therefore continues to sensitise P5 to public speaking scenarios (e.g., Marshall, 1988).

4. The intervention may have been successful in increasing P5's willingness to approach public speaking scenarios, however, may not have been successful in developing P5' ACT related skills (e.g., present-moment awareness) or led to a large reduction in speech anxiety.

4.1.2 P6

P6 was a female who reported regularly avoiding public speaking tasks related to her university course, and placements. P6 reported having PSA when delivering speeches in most contexts, to small or large audiences. She described her most feared public speaking scenario as giving a speech to a large group of assessors on a complicated topic.

During the intervention, P6 completed the requisite reading on time and reported completing the exercises in each chapter. However, during telephone contact and the completion of the battery measures, P6 reported that she found the workbook unnecessarily complicated, and disliked the use of American phrasing throughout. She also reported that this frustrated her at times, which led her to disengage slightly from the book.

On completion of the treatment phase, the final speech BAT was discussed. P6 immediately said that she did not want to take part, and had never intended to. She reported that the anxiety the task would cause would be too demanding on her considering the level of her university commitments.

A number of hypotheses could explain why P6 did not take part in the final speech BAT, despite reporting improvements in psychological flexibility, three ACT processes, and a reduction in distress caused by the imagined public speaking scenario:

1. As briefly mentioned in the journal paper, P6's responses on the self-reported measures may have reflected her becoming socialised to the ACT model (e.g., the use of ACT vernacular to describe her experience) rather than the success of the ACT intervention. This hypothesis is perhaps supported by evidence from the idiographic

SUDS scores that either showed little change (distress), or no change at all (avoidance and willingness).

2. The intervention may have been partially successful in developing P6's psychological flexibility (as evinced by shifts in both the daily and weekly measures), however, this change was not enough to increase P6's willingness to engage in public speaking behaviour. Therefore raising the possibility that P6 may have required a 'higher dose' of ACT than is provided through self-help methods alone; in order to increase her understanding, and encourage experiential exposure.

3. The nature of the BAT may have reflected P6's most feared public speaking scenario, to the point that engagement in this task was too anxiety provoking, even though her psychological flexibility had increased. This indicates that the intervention was not effective in altering P6's willingness to approach public speaking, but may have been successful in developing P6's psychological flexibility in other areas of her life. This was possibly reflected in P6's refusal to engage in the BAT (i.e., resisting experimenter demands / focussing on own valued actions).

4. P6's results (as with P5) could indicate that self-report measures are not appropriate / accurate in measuring ACT treatment, and that behavioural/functional measures are the most accurate in determining treatment success; given the foci of the ACT model on altering behavioural responses, rather than private events.

4.2 The IRAP Findings, and Recommendations for its use in Future Research

The mixed IRAP findings suggest a number of hypotheses that are presented in the journal paper. The most likely hypothesis, however, is that the IRAP was not designed in a manner that was sensitive to the ACT treatment. In the present study, the IRAP was designed to measure first-order change / public speaking propensity (e.g., public speaking stimuli = "makes me anxious") rather than second-order change / public speaking sensitivity (e.g., public speaking stimuli ="I cannot tolerate public speaking")[16]. This may have been an oversight, and could explain why the IRAP failed to predict all the participants' behavioural responses to the BAT.

As the goal of ACT is to develop an individual's willingness to experience unpleasant private events and feared situations, in the context of pursuing values-based ends (Hayes & Strosahl, 2004), first-order change, or reducing an individual's public speaking anxiety propensity was not the principal aim of therapy. Hence, the design of the IRAP used in the present study was somewhat incongruent with this model, and was therefore measuring a construct not thought to be influenced by ACT.

Therefore, an IRAP measuring second-order change, or public speaking sensitivity, may have been more accurate in capturing the type of change predicted by the ACT model (to reduce the negative manner in which distressing private events are experienced / appraised).

Support for this notion comes from a study investigating the development of an IRAP designed to examine the role of implicit disgust in obsessive-compulsive tendencies (Nicholson & Barnes-Holmes, 2012). This study found that an IRAP created to measure disgust sensitivity (e.g.,

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[16] Anxiety *propensity* refers to how anxious an individual becomes. Anxiety *sensitivity* refers to how negatively this feeling is appraised (Nicholson & Barnes-Holmes, 2012).

disgusting image = "I cannot tolerate it") accurately predicted avoidance behaviour on a series of BATs, whereas, the IRAP created to measure disgust propensity (e.g., disgusting image = "I am disgusted") did not.

As such, future research using implicit measures such as the IRAP to measure treatment effects, should carefully consider the theoretical underpinnings of the treatment under examination to determine whether the implicit measure should be calibrated to capture first- (Propensity) or second-order change (sensitivity).

4.3   The Findings in the Context of Previous Research and Theory

4.3.1 Support for the Cognitive Model of PSA

Although ACT is a treatment model underpinned by behavioural theory (Hayes & Strosahl, 2004), the model, and the findings of the current study may provide support for the cognitive model of SAD / PSA. Clark and Wells' (1995) cognitive model of social phobia / PSA postulates that an individual's pre-occupation with their negative appraisal of themselves, others, and their physiological reactions during public speaking scenarios, leads to the experience of PSA. According to this model, PSA is maintained until an individual stops engaging in this 'self-focus' of attention, and allows themselves to attend to their surroundings. This attentional shift enables the individual to experience the situation objectively, which in turn challenges their negative assumptions (e.g., with regard to their ability, the behaviour of others, and the effects of their somatic responses) (Clark & Wells, 1995). A key method in cognitive therapy for PSA is therefore the development of the individual's ability to shift their attention to external processes, in order for exposure experiments to produce optimal belief change (Clark & Wells, 1995).

In many respects, the ACT model of PSA is similar to the cognitive model, in that an individual's attempts to rid the self of distressing private events (e.g., thoughts, emotions, and somatic sensations) leads to the development of a pre-occupation / entanglement with them, which in turn maintains PSA through psychological rigidity.

In the present study, it seems that the development of mindfulness / present-moment awareness, may have been the most influential treatment phase for the majority of participants. Hence, it seems that, similarly to cognitive treatment for PSA, the development of external attentional strategies (cognitive) / present-moment awareness (ACT) appears to have led to ameliorative change. However, the reason *why* the development of these skills leads to this change, differs according to which perspective one takes. From a cognitive perspective, this shift of attention enables an individual to gather counter evidence in order to challenge the negative thoughts that are maintaining their PSA (Clark & Wells, 1995). From an ACT perspective, the development of present-moment awareness allows an individual to notice their surroundings, bodily sensations, and private experiences, without being influenced by their thoughts, and thus not engage in acts of experiential avoidance. From an ACT perspective, contact with the present-moment during exposure exercises is also theorised to reduce an individual's entanglement with their private experiences, thereby allowing the individual to remain in the feared context and learn that anxiety is not 'bad' and therefore does not need to be removed (Hayes & Strosahl, 2004).

Hence, although both schools of thought may differ in why the development of present-moment awareness / external attentional strategies reduce PSA, the findings from the present study offers support for both models and highlights the importance of fostering present-moment awareness skills when treating PSA.

4.3.2 Exposure Therapy

In a study examining traditional exposure, versus acceptance-based exposure treatment for PSA, England and colleagues (2012) found no significant difference between the two groups. However, the researchers noted that the participants' baseline level of mindfulness and acceptance moderated treatment response, with regard to state anxiety and public speaking related cognitions. In other words, individuals with higher levels of mindfulness and acceptance at baseline, experienced greater increases in positive self-statements and reductions in anxiety post-treatment, compared to individuals with lower levels of mindfulness and acceptance at baseline. The authors concluded that this indicated that one's ability to be 'mindfully aware' of one's environment / experience may enhance one's capacity to engage in, and benefit from exposure (England et al., 2012).

Similarly to the findings of England and colleagues (2012), the present study found that the participant with the lowest overall baseline scores on the ACT theoretical processes (P2), showed the least overall improvement, and also chose not to complete the BAT. This adds further support for the notion that one's level of mindful awareness and acceptance may (1) predict engagement in exposure-based tasks (e.g., ACT exercises and BATs), and (2) determine how effective an exposure-based treatment may be.

These findings are important when considering an individual's suitability for ACT self-help treatment for PSA, as it seems those who initially report low scores on ACT related processes, may require a greater level of support than a self-help approach can provide, in order for the treatment to be effective. In such a case, a higher level of intervention (e.g., individual 1:1 ACT) may be required in order for such individual's to develop the skills needed to approach, and benefit from exposure to public speaking related stimuli.

England and colleagues also noted that providing an acceptance and valued-action based rationale for exposure therapy, may benefit those with PSA who would otherwise avoid such forms of treatment (England et al., 2012). This notion is supported in the findings from the present study as (1) the participants who chose to complete the BAT all said that they would not have completed such a task prior to the intervention; indicating that the ACT treatment provided a rationale for doing so, and (2) the participants who chose not to complete the BAT, also found the workbook hard to understand; indicating that they did not engage in the BAT as they were not provided with, or fully understood, the rationale for doing so.

4.3.3 Experiential Avoidance

The present study demonstrated that the ACT intervention led to an increase in willingness that predicted engagement in the BAT. More specifically, the present study highlighted that those who became more willing to imagine themselves in their most feared public speaking scenario, went on to complete a 'real-life' public speaking task. This suggests that the ACT intervention in the present study reduced these participants' experiential avoidance of private events (thoughts, emotions, and somatic sensations) and contexts related to public speaking. Thus indicating a relationship between the development of willingness (or a reduction in experiential avoidance) and valued-behaviour change, with regard to PSA.

Such findings concord with previous research investigating ACT to treat PSA (e.g., Block & Wulfert, 2000) or more generalised SAD (e.g., Dalrymple & Herbert, 2007; Ossman, Wilson, Storaasli, & McNeill, 2006), as such studies also found that the ACT intervention appeared to produce decreases in experiential avoidance, that preceded increases in functioning and value-directed behaviour. This provides support for the ACT model of SAD/PSA, and also highlights the importance of targeting

experiential avoidance behaviour when using ACT to treat PSA and more generalised forms of SAD.

4.4 Strengths and limitations

4.4.1 Treatment fidelity

A number of steps were taken to increase the methodological rigour of the present study that were not presented in the journal paper. Such steps were taken to ensure the validity and reliability of the findings. One such step was to conduct treatment fidelity checks (Moncher & Prinz, 1991) to ensure that the telephone support/advice given to each participant was delivered using the ACT model. These checks were conducted to strengthen inferences regarding the effects of the ACT treatment, and were done to ensure that the therapist offering support did not use other models of therapy (e.g., CBT; thought challenging) during the weekly telephone calls. As such, the telephone calls to each participant during the study were recorded using a Dictaphone and were reviewed by two independent researchers (trainee clinical psychologists).

Guided by Plumb and Vilardaga (2010), 20% of the participant telephone calls were randomly selected and reviewed. Both independent reviewers rated the researcher's adherence to the ACT model (on a three-point scale; 1 – no, 2 – somewhat, and 3 – yes) using the following criteria:

1. Did the researcher 'check-in' with the participant?

2. Was advice provided consistent with ACT or were discussions in line with the ACT model?

3. Was any advice provided that was inconsistent with ACT (e.g., thought challenging)?[17]

4. Was the researcher competent in guiding the participant?

There was 100% inter-rater reliability between the reviewers, and both reviewers gave the maximum score on all the phone calls reviewed. This indicated that the researcher providing participant support during the intervention phase remained adherent to the ACT model, thus strengthening any inferences that any recorded changes during the study were a result of the ACT self-help intervention, rather than alternative therapeutic approaches.

4.4.2 Additional Methodological Considerations

A number of additional steps were also taken to improve the study's methodological rigour. All participants were pre-screened to ensure they reached a minimum level of PSA (using the SSPS-N) prior to inclusion in the study. This was done to ensure that the sample was representative of a PSA cohort, and also eliminated participants who may have wished to take part just to receive compensation.

To demonstrate the relationship between changes in willingness to approach an imagined feared public speaking task, and actual behavioural change, a final BAT was included. This allowed us to demonstrate that increases in levels of willingness appeared to lead to behavioural change related to PSA (as only those who took part in the BAT experienced an increase in willingness); something that would not have been possible had a BAT not been included.

Although the principal reason for the BAT was to assess the participants' willingness to engage in public speaking behaviour post-intervention, the inclusion of the observer-rated speech-performance measure gave insight

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[17] This item was reversed for scoring

into each participant's overt anxiety during the performance and allowed us to contextualise the participants' performance against that of a clinical sample. Recording each participant's time in the BAT also allowed us to measure the quality of engagement in the task. However, as the audience used during the BAT consisted of clinical psychologists and/or trainee clinical psychologists, one must exercise caution when interpreting the observer-rated results, as individuals in such a profession may be more empathetic and compassionate (Daw, 2006). Hence, the audience may have awarded higher scores than an audience consisting of members from the general population / mixed professions would have.

The methodological rigour of the present study may have been improved if a follow-up design was included (potentially making the design an ABCA design). The addition of a follow-up element may have informed us of whether (1) treatment gains remained or improved for those who experienced an increase in willingness to approach public speaking contexts (and who also completed the BAT), (2) whether the participants who reported the least change during the intervention experienced improvements post-intervention, and (3) whether the BAT influenced the participants' PSA (as the BAT may have acted as an intervention in and of itself). This latter point would have been of particular interest given that the BAT may have been a sensitising (versus habituating) event, and therefore may have increased rather than reduced the participant's PSA. Hence, the inclusion of a follow-up may have informed us of whether the ACT intervention resulted in a lasting reduction in public speaking behaviour, and/or whether the ACT intervention appeared to support the participant's to habituate to public speaking situations or not (as recorded following the BAT).

As research allegiance is regarded as a potential risk to psychotherapy outcome research (Munder, Brütsch, Leonhart, Gerger, & Barth, 2013), an independent researcher, blind to the participants' performance during the study, conducted the final change interviews. This was done to reduce the

chance that the participants' responses during the interview were influenced by demand characteristics (e.g., attempting to please the researcher), and to prevent the interview from being influenced by the desires of the researcher (e.g., the use of closed questions to elicit a desired response).

4.4.3 Limitations

Although steps were taken to increase the methodological rigour of the study, there were still a number of possible limitations.

4.4.4 Baseline / Daily Measure

The measure used to record the baseline period prior to the onset of the intervention was a composite ACT measure designed to measure overall psychological flexibility. This provided evidence that each participant's psychological flexibility was either stable, or in decline, prior to the onset of therapy. This baseline measure, however, did not include an assessment of PSA. This raises the possibility that, as no stable period of PSA was achieved prior to the treatment phase that reductions seen in PSA may have occurred due to factors not associated with the ACT intervention. However, this decision not to include a measure of PSA in the baseline phase was made for a number of reasons.

The principal focus of the intervention was on ACT-relevant processes (increasing willingness to experience public speaking anxiety, in the service of acting in a more valued way) rather than on symptom reduction (as this is not an ACT hypothesised outcome), hence, capturing a stable baseline period of ACT processes (psychological flexibility) was of primary importance. Moreover, in order to reduce participant burden, the items included in the daily measure were kept to a minimum. As such, measures of PSA were administered during the weekly and battery

assessments, but not daily, in order to reduce the number of items included in the daily measure.

Lastly, as the primary measure of PSA (SSPS-N) requires respondents to answer questions whilst imagining their last public speaking experience, and evidence suggests that repeated imaginal exposure may reduce social anxiety related difficulties (Vrielynck & Philippot, 2009), the repeated daily administration of this measure may have acted as an exposure intervention, and thus a confounding variable.

Although no baseline measure of PSA was taken, PSA was captured on multiple occasions and via multiple data sources (self-report outcome questionnaires, change interview, behavioural task, and indirect/implicit data) over the course of the intervention.

4.4.5 Acceptance Phase

The participant's read the ACT self-help workbook in stages, one core process per week. The number of chapters the participant's read however, was dependent on how many chapters the workbook had assigned to each processes. For example, during the final week, participants were only required to read one chapter related to 'committed action', whereas during the first week, each participant was required to read four chapters relating to 'acceptance'. This meant that during the first week of the treatment phase, each participant had to read the most compared to any other phase in the study. This may have resulted in a 'higher dose' of the ACT component, acceptance, compared to the other ACT components. However, as a number of participants reported either no-change, or a reduction in psychological flexibility during the first week, this 'higher dose' of reading associated with the component of acceptance may have been burdensome / aversive for many participants. Thus, the participants may have initially developed a counterproductive /negative association with ACT and the concept of acceptance. Conversely, as the following

phases only required the participants to read one (self-as-context, present-moment awareness and committed action) or two chapters (cognitive defusion and values); reported increases in psychological flexibility may have been, in part, due to relief and/or reduced response burden, rather than the effects of the ACT intervention alone.

4.4.6 Generalisability

The sample in the present study predominantly consisted of female university undergraduates. Although this sample was partially representative of a typical PSA cohort (as more women are thought to experience PSA than men [71.9%; Stein, Walker, & Forde, 1996]), the generalisability of the findings are limited. Therefore, more research is required in this domain to strengthen inferences that ACT delivered in a self-help format is an effective treatment for PSA (that rivals the existing gold standard method of treatment; CBT), especially when considering the treatment of children, young people, and older adults.

4.4.7 Idiosyncratic Measurement

Although an idiosyncratic measure was used to measure change in the form of SUDs responses to each participant's feared imagined public speaking task, the present study could have benefitted from the use of more idiosyncratic measures and/or individual goals to determine treatment success.

For example, many of the participants in the present study stated that they had different forms of public speaking fears (e.g., speaking-up during a meeting vs. delivering a speech at wedding). Hence, the use of an idiosyncratic measure designed to capture each participant's core public speaking fear may have been more sensitive to capturing change relevant to each participants. Moreover, asking participants to set themselves individual treatment goals from the outset, may have more accurately determined which participants experienced the most

meaningful changes above and beyond the use of standardised / self-reported measures.

4.4.8 Isolation of Variables

Although the SCED methodology allowed us to measure the effects of each component of the ACT intervention on a number of measures, this methodology meant that it was difficult to isolate the variables responsible for any observed changes in public speaking anxiety, and public speaking behaviour. In other words, a range of interventions may have been responsible for the changes observed (in addition to, or extraneous to the ACT intervention). Hence, independent variables such as the weekly contact with the researcher, repeated measurement, the IRAP, and the imminence of the BAT may have influenced the manner in which the participants behaved.

For example, participants may have:

1.) modified or improved aspects of their behaviour in response to their awareness of being observed (observer effect / Hawthorne effect) (McCarney et al., 2007).

2.) habituated to public speaking situations as a consequence of being exposed to public speaking stimuli during the IRAP, and/or being exposed to thoughts regarding public speaking (private events) as a consequence of the impending BAT.

3.) responded in a manner to please the researcher as a consequence of the developing therapeutic relationship that took place during the weekly contact.[18]

As such, it cannot be said with certainty that that the ACT intervention was solely responsible for recorded changes during the intervention phase. However, the isolation of variables may be an inherent difficulty in SCED research given the high number of measures participants are often

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[18] This is not an exhaustive list, but an example of the possible variables responsible for change.

required to complete, the number of tasks/interventions participants usually engage in, and the often regular contact with researchers/therapists.

4.4.9 Serial Dependency

Judgements of clinical significance are often based on the visual analysis of graphed data in SCED research (Parsonson & Baer, 1986) (as with the time-series / daily measure in the present study). However, there is a lack of well-defined rules to determine whether clinically significant change has occurred across phases (Bloom, Fischer, & Orne, 1995), and some have argued that changes need to be extremely large to convincingly demonstrate the presence of an experimental effect (Parsonson & Baer, 1986).

Due to this lack of consensus, practitioners / researchers often rely on 'visual common sense' when making decisions about treatment effects (Bengali & Ottenbacher, 1998), which has raised questions regarding the reliability and suitability of visual analysis (e.g., inter-rater reliability; Ottenbacher, 1993).

One factor thought to play an influential role in the judgement of visually analysed data is the presence of autocorrelation in the data-set (Bengali & Ottenbacher, 1998). Autocorrelation reflects the level of correlation (serial dependency) present, and is a consequence of the fact that responses by the same individual (to the same measure over time) will be related to one another (to a greater or a lesser extent) (Bengali & Ottenbacher, 1998). This level of correlation is important, as research indicates that a high level of serial dependency may reduce the examiners ability to accurately interpret time-series data (Matyas & Greenwood, 1996). For example, in a study investigating the impact of serial dependency on visual judgements, Jones, Weinrott, and Vaught (1978) compared the conclusions of time-series data analysed using both visual inspection and statistical procedure (Time-series analysis). Jones et al., (1978)

discovered that the highest level of discrepancy existed between visually analysed data, and data analysed using statistical procedure in data-sets with the highest level of serial dependency. In other words, it seems that those using visual analysis in SCED research are more likely to make a type-I or type-II error if the data-set being analysed contains a high level of serial dependency. As such, it is recommended that data-sets are investigated to determine the level of serial dependency present, and the influence that this may have on the outcome of visual analysis (Bengali & Ottenbacher, 1997)[19].

As the time-series data-set (daily measure of psychological flexibility) in the current study was not investigated for the presence of serial dependency, it is possible that our findings (and suggestions of a treatment effect) were influenced by the presence of serially dependent data rather than a genuine treatment effect. As such, the conclusions drawn from the visual analysis in the present study should be treated with caution.

4.5   Clinical Relevance

4.5.1 Self-help ACT

The current study lends partial support for the use of ACT to treat PSA. Moreover, the present study demonstrated that this form of therapy may be effective when delivered in a self-help format, with minimal therapist support. This suggests that successful ACT treatment for PSA may not require a high level of intervention (e.g., 1:1 therapy) for the majority of individuals seeking support. As such, services may wish to consider providing ACT self-help material to individuals with PSA in the first instance, prior to offering more direct and/or intensive forms of

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[19] It is possible to compute serial dependency and account for this (e.g., using Simulation Modelling Analysis)

treatment. Additionally, self-help ACT may also be offered as an alternative to traditional forms of therapy for PSA (e.g., CBT/exposure), especially for individuals who may find exposure therapy too anxiety provoking. However, further research is needed to determine whether (1) ACT is as effective as CBT in treating PSA, and (2) whether ACT may only be effective for certain individuals.

As the present study demonstrated that ameliorative results can be achieved with a relatively miniscule dose of ACT (when compared to 1:1 therapy), services should consider how offering self-help ACT interventions for individual's with PSA may (1) reduce the overall cost of treating such presentations, (2) reduce the likelihood of individuals with PSA developing more debilitating difficulties (e.g., wider SAD) and (3) allow clinicians to dedicate more time to treating individuals with potentially more chronic and debilitating psychological difficulties.

4.5.2 Suitability for Self-help

Although the majority of participants in the present study reported a reduction in PSA, an increase in willingness to approach feared public speaking scenarios, and approached the final BAT; the self-help intervention did not lead to this change for two individuals. Both these participants reported that they found the workbook hard to understand, and one participant reported the lowest overall scores on the ACT process measures prior to intervention. This suggests that certain considerations should be made when determining an individual's suitability for self-help ACT treatment for PSA.

4.5.3 Pre-screening

Like the extant literature (e.g., Dalrymple & Herbert, 2007; Ossman, Wilson, Storaasli, & McNeill, 2006), the present study found that the patient with the lowest ACT process scores at baseline, appeared to

benefit the least from the ACT intervention. As such, it may be appropriate for individuals to reach a minimum score on a number of ACT process measures to indicate their suitability for ACT treatment in a self-help format, for PSA. Additionally, such a pre-screening method may also identify individuals who may require a more direct/intensive ACT intervention, or who may benefit from an alternative treatment approach. However, further research is required to identify this potential cut-off point.

4.5.4 Self-help Material Modifications

As previosuly mentioned, the two participants who did not report an increase in willingness to approach public speaking situations, and who consequently did not compelte the final BAT, also reported they found the workbook difficult to understand. One of these participants also remarked that she found the workbook too 'Americanised'. As such, services providing ACT self-help material may need to consider how making slight adaptations to the text / material may increase its readability and therefore impact. Hence, altering or reducing jargonistic language, and simplifying theoretical passages may increase the treatment effects of the workbook. Additionally, altering the language to reflect the country in which the workbook is being distributed may also improve the effectiveness of self-help ACT material to treat PSA.

4.6 Future Research

4.6.1 Determining a cut-off for Suitability for ACT Self-help Treatment

As the previous section explained, individuals who report a low baseline score on ACT process measures may require a higher level of ACT intervention, in order for the intervention to have an effect. This indicates that a cut-off point exists that may determine whether an individual is suitable for ACT delivered in a self-help format, or not. As such, future research may consider investigating where this cut-off point lies, on either a battery of ACT process measures, or a unified ACT processes screening measure. Such research may lead to individuals being offered the appropriate treatment for their PSA.

4.6.2 Future SCEDs

4.6.3 Treatment Phase

Future research employing a SCED methodology may need to consider the implications of delivering ACT in a phased manner. As the acceptance phase in the present study included a large amount of material (larger than any other phase during the intervention phase), future research may need to consider how each treatment phase can include an equal 'dose' of ACT, whether this is in a self-help format or not. This increases the likelihood that reported changes in the constructs of interest (in our case PSA and ACT processes), are due to the effects of the treatment, and not simply a result of increased or reduced participant burden.

4.6.4 Baseline Phase

In the present study, the baseline phase only consisted of a composite ACT measure. Although this decision was made with careful consideration, it may have also meant that a comprehensive baseline assessment of PSA was not achieved, raising questions of whether all participants' PSA was stable, or increasing, prior to the introduction of the treatment phase. Hence, to increase the validity of inferences made regarding the effectiveness of ACT to treat PSA, future studies should ensure that SCEDs include a baseline measure of PSA, as well as a measure of theoretical ACT processes. However, careful consideration should be taken to ensure that including a baseline measure of PSA does not overburden the participants and that the repeated administration of this measure does not act as a form of exposure in and of itself.

4.6.5 Assessment of Mediators / Mechanisms

The continued use of SCED methodology to investigate ACT to treat PSA may be a cost effective manner in which to assess the potential mediators involved in successful treatment, given the relatively cheap cost of such an approach (Kazdin, 2009). Hence, across many studies, certain mediators may repeatedly emerge as possible contenders, while others may fall by the wayside (Kazdin, 2009). Such continued replications may therefore support or refute the assertion that the ACT process of mindfulness may play a crucial role in the treatment of individuals with PSA.

4.6.6 Measures of PSA

In a recent systematic review of psychological treatments for PSA (Priestley et al., 2014), the measures used to determine treatment

success in the reviewed studies predominantly consisted of self-reported measures of social anxiety (e.g., the Fear of Negative Evaluation: FNE; Leary, 1983); the majority of which were created in the context of Clark and Wells' (1995) cognitive model of SAD. There was also an under-reliance on behavioural/performance measures of PSA (Priestley et al., 2015). This raises implications as (1) cognitions may not change as a result of ACT treatment, and (2) functional / behavioural changes (the primary outcome of ACT treatment) may have been ignored.

As such, future research should consider using measures of functional / behavioural change when investigating the effects of ACT to treat PSA, rather than the use of self-reports designed to assess the effects of treatment within a cognitive framework. The use of BATs may achieve this goal, however, researchers may need to consider how the repeated use of in-vivo assessments may act as an exposure intervention, thus making it difficult to infer a causal relationship between ACT alone and changes in behaviour related to public speaking.

5. Critical Reflection

This section presents my critical reflections on the research process, with a focus on how the scientist practitioner model influenced my decision to use an SCED methodology. I also present my critical reflections on the ethical and theoretical issues raised by the research.

5.1   Scientist-Practitioner

During the early stages of my research project, I felt a pressure to use a between groups, randomised control trial (RCT) design. This was not a pressure that I felt from my peers or course staff, but a pressure I felt from the scientific community in general. There seemed to be an assumption (and I believe there still is) that in order to reliably investigate the effects of a treatment, one must use a RCT design; and all other methodologies paled in comparison. I believe this discourse has emerged, especially within the field of Clinical Psychology, in parallel with the development of the National Institute for Health and Clinical Excellence's (NICE) guidelines; where only the evidence gathered from RCTs appears to be referenced. Although I realise the methodological benefits of such a design, I wished to conduct my research in a manner that would allow me to learn skills that I could practically apply in both my role as a researcher, and as a clinician during, and after my training.

During the developmental stage of my research, I became aware of the SCED. I immediately became interested in this approach, due to the SCEDs ability to demonstrate the effects of treatment, with the use of minimal resources. Moreover, the principal attraction of the SCED, was that it appeared to be a methodology that perfectly satisfied the contemporary role of the Clinical Psychologist; the scientist-practitioner. I believe this, as this methodology can be used to assess personal effectiveness as a Clinical Psychologist (practitioner), as well as a comprehensive method for investigating the effects of treatment across

multiple-subjects for the purpose of research (scientist). Hence, I felt passionate about developing my knowledge of, and skills in administering SCED research, as I felt such an approach would allow me to conduct meaningful research, whilst also practicing as a Clinical Psychologist in the future.

Although I liked the notion of the SCED, I initially felt overwhelmed by all of its components, and the different approaches that appeared in the literature. Hence, I decided to conduct a 'practice' SCED (examining the effects of the psychological treatment I was delivering), whilst on placement in order to learn the skills I would need to conduct the present research.

I found conducting this preliminary SCED allowed me to develop my knowledge, but also highlighted key biases that I would have to address in the present study. I noticed that during this preparatory SCED, my desire to demonstrate that the treatment had produced a reliable effect, altered my behaviour. I found myself overly planning my psychotherapy sessions, and trying to please the patient. I also noticed that I would complete the outcome measure with the patient, so I could monitor her responses, and clarify any particularly low scores, to ensure their accuracy.

I realised that these behaviours acted as 'experimenter biases', and may have resulted in the collection of data that magnified the treatment effect; as the patient may have not received a typical form of therapy, and most likely felt pressured to answer the outcome measure in a manner that did not invite further questioning. These findings highlighted that I had to take a number of steps to maximise the validity and reliability of the present research if I was going to be responsible for the administration of the treatment under inspection.

This experience significantly influenced the design of the present study. To reduce the potential for experimenter bias, I decided to use a self-help

format of ACT. This improved the likelihood that each participant would receive a similar level of intervention, and also meant I would have minimal therapeutic contact with each participant (thereby reducing my influence over the intervention process).

I also ensured that the outcome measures in the present study could be completed by each participants on-line. This choice was made largely for pragmatic reasons, however, as I would not be administering these measures directly, it reduced the likelihood that the participants would respond in a manner to please me, or avoid my disapproval.

For the times I had contact with each participant, I ensured I recorded our conversations, and that these conversations were subjected to treatment fidelity checks. This was to ensure that (1) I was providing support from an ACT perspective, and (2) I was not using other therapeutic methods in an attempt to reduce the participants PSA.

Finally, I requested a fellow trainee Clinical Psychologist conduct the change interviews. This again reduced any potential pressure each participant may have felt to respond in accordance with my explicit or implicit desires.

I found myself wondering if other researchers employing an SCED methodology applied such protocols in order to improve the methodological rigour of their research. My general opinion when asking myself this question was, no. During the whole research process, I encountered a number of published SCEDs. The majority of these appeared overly reliant on visual analysis and did not analyse reliable or clinical change. Moreover, effect size calculations were rarely considered, and inclusion of alternative methods of measuring change (e.g., other than self-reports) were often neglected. Repeatedly finding such examples in the literature frustrated me, and I questioned whether my research would be seen as beneath, or less important that studies investigating a similar phenomenon, but with a RCT design.

On reflection, I believe the SCED is a valuable tool for understanding *if* and *why* changes occur during therapy. Unfortunately, this methodology's greatest strength; that it can be conducted by the practicing clinician, may be its greatest weakness, as such researchers may not feel obliged to abide by the same rigour as those who are solely situated in the scientific community. However, if the same stringent guidelines for conducting RCTs are applied to SCEDs (e.g., Stanley, 2007), then I see no reason why SCED research cannot be considered alongside RCTs in terms of validity and importance. Moreover, this may facilitate a move from the question of *which* psychological therapies cause ameliorative change, to the potentially more clinically useful question of *why* such changes occur*.*

5.2   Ethical Reflections

A major component of the study was the BAT. I felt this was an essential element of the research, as it allowed us to measure participants' willingness to engage in public speaking in an ecologically valid way. However, this part of the study raised some ethical difficulties for me. Most of the participants who took part in the present study were university undergraduates. As such, I found myself wondering if I would have completed such a task as an undergraduate, and how I would have coped. Although I would feel able to approach such a situation today, had I been placed in a similar position during my undergraduate years, I think I would have found the task extremely distressing. I therefore experienced a sense of guilt when discussing and arranging the task with the participants. I also questioned whether it was ethically right to place people in a situation that would have caused (and to some extent still would) me great discomfort.

I thought about this for some time, especially after arranging the first BAT. I felt a sense of relief knowing that an ethics panel had agreed for the research to go ahead, and that the BAT was voluntary, but I

continued to feel a sense of guilt. However, thinking about psychological research in general, and the need to understand human suffering for benevolent purposes, allowed me to consider the negative impact of withholding such methodological components. Such a risk-averse research culture would greatly reduce our understanding of human behaviour, and therefore, the methods that can be employed to reduce distress. Hence, allowing myself to consider the potential impact of my research on the development of effective treatments for PSA, enabled me to realise the value of including such a task.

5.3   Theoretical Reflections

From a functional contextualist (radical behaviourist) position, everything an organism does is behavioural (Harris, 2009). This notion includes external and internal events (or private events in ACT); all of which serve a specific function. I subscribe to this way of thinking, and believe that considering the function of a behaviour is more important (especially for treatment purposes), than focussing on the form of the behaviour. A dominant model of social anxiety, often used to inform PSA treatment (e.g., Wells, 1997), is Clark and Wells's (1995) cognitive model. From this perspective, cognitions are seen as distinctly different from behaviour, and the form of these cognitions, are considered the root cause of distress in public speaking situations.

Understanding thoughts as a form of behaviour, rather than cognitions that lead to behavioural change, may be a radical conceptual departure for a cognitive psychologist. However, I found myself wondering during the research whether this difference in opinion may be more of a semantic difference, rather than a theoretical one; as both models place importance on the impact of 'thinking/thought', whether this is understood as a private-event (behavioural) or a thought (cognitive).

From a treatment perspective, however, the two theoretical positions seem completely opposed. ACT suggests that altering the context in which behaviour (e.g., private events) occurs, produces remedial change, whereas the cognitive model suggest that altering an individual's cognitions is the key to successful treatment. However, I again found myself wondering whether the mechanisms of change may be similar in both approaches. I wondered whether suggesting a client weigh up the evidence for the validity of their thoughts (cognitive) may ultimately alter the context in which these thoughts occur, by enabling the patient to see their thoughts from a more objective / observer-based position. Alternatively, I wondered whether the approach of separating a client from their thoughts (ACT), ultimately alters the form of thoughts themselves in the longer-term.

Hence, from a pragmatic standpoint, it seems that both theoretical approaches may seek a similar treatment goal; however, one method may be suited to some individuals over others, and visa-versa. Hence, the further investigation into which methods of treatment suit which individuals, and why, should remain an important focus of future research to ensure individuals receive the most effective form of treatment.

Extended References

Abramowitz, J. S., Tolin, D. F., & Street, G. P. (2001). Paradoxical effects of thought suppression: A meta-analysis of controlled studies. *Clinical Psychology Review*, *21*(5), 683–703. doi:10.1016/S0272-7358(00)00057-X

Acarturk, C., Cuijpers, P., van Straten, A., & de Graaf, R. (2009). Psychological treatment of social anxiety disorder: A meta-analysis. *Psychological Medicine*, *39*(2), 241–254. doi:10.1017/S0033291708003590

Aderka, I. M., Hofmann, S. G., Nickerson, A., Hermesh, H., Gilboa-Schechtman, E., & Marom, S. (2012). Functional impairment in social anxiety disorder. *Journal of Anxiety Disorders, 26,* 393-400. doi:10.1016/j.janxdis.2012.01.003

Allen, M., Hunter, J. E., & Donohue, W. A. (1989). Meta-analysis of self-report data on the effectiveness of public speaking anxiety treatment techniques. *Communication Education*, *38*(1), 54–76.

American Psychiatric Association. (1994). Diagnostic and statistical maunual of mental disorders: DSM-4 (4th ed.). Arlington, VA: American Psychiatric Publishing.

American Psychiatric Association. (2013). *Diagnostic and Statistical Maunual of Mental Disorders: DSM-5* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Amies, P. L., Gelder, M. G., & Shaw, P. M. (1983). Social phobia: a comparative clinical study. *British Journal of Psychiatry*, *142*, 174–179.

Anderson, P. L., Price, M., Edwards, S. M., Obasaju, M. a, Schmertz, S. K., Zimand, E., & Calamaras, M. R. (2013). Virtual reality exposure therapy for social anxiety disorder: a randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *81*, 751–60. doi:10.1037/a0033559

Antony, M. M., Roth, D., Swinson, R. P., Huta, V., & Devins, G. M. (1998). Illness intrusiveness in individuals with panic disorder, obsessive-compulsive disorder, or social phobia. *The Journal of Nervous and Mental Disease*, *186*(5), 311–315. doi:10.1097/00005053-199805000-00008

Backman, C. L., Harris, S. R., Chisholm, J.-A. M., & Monette, A. D. (1997). Single-subject research in rehabilitation: A review of studies using AB, withdrawal, multiple baseline, and alternating treatments designs. *Archives of Physical Medicine and Rehabilitation*, *78*(10), 1145–1153. doi:10.1016/S0003-9993(97)90142-8

Bandura, A. (1963). *Social learning and personality development*. New York: Holt, Rinehart, and Winston.

Barlow, D. H., Nock, M. K., Hersen, M. (2008). *Single case research designs: Strategies for studying behavior change* (3rd ed.). New York: Allyn & Bacon.

Barnes-Holmes, D., Barnes-Holmes, Y., Power, P., Hayden, E., Milne, R., & Stewart, I. (2006). Do you really know what you believe? Developing the implicit relational assessment procedure (IRAP) as a direct measure of implicit beliefs. *The Irish Psychologist*, *32*, 169–177.

Barnes-Holmes, D., Murphy, A., Barnes-Holmes, Y., & Stewart, I. (2011). The implicit relational assessment procedure: exploring the impact of private versus public contexts and the response latency criterion on pro-white and anti-black stereotyping among white Irish individuals. *The Psychological Record*, *60*(1), 4.

Barnes-Holmes, D., Waldron, D., & Barnes-Holmes, Y. (2009). Testing the validity of the implicit relational assessment procedure and the implicit association test: Measuring attitudes towards Dublin and country life in Ireland. *The Psychological Record*, *59*, 389–406. doi:10.1016/j.tetasy.2006.11.045

Bebbington, P. E., Brugha, T. S., Meltzer, H., Jenkins, R., Ceresa, C., Farrell, M., & Lewis, G. (2000). Neurotic disorders and the receipt of

psychiatric treatment. *Psychological Medicine*, *30*, 1369–1376. doi:10.1017/S0033291799002974

Bebbington, P. E., Meltzer, H., Brugha, T. S., Farrell, M., Jenkins, R., Ceresa, C., & Lewis, G. (2000). Unequal access and unmet need: neurotic disorders and the use of primary care services. *Psychological Medicine*, *30*, 1359–1367. doi:10.1017/S0033291799002950

Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York: International Universities Press.

Biglan, A. (2011). *changing culture practices: a contextualistic framework for intervention research*. Reno: NV: Context Press.

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:http://dx.doi.org/10.1016/S0962-1849(96)80026-6

Blackledge, J. T. (2003). An introduction to Relational Frame Theory: Basics and Applications. *The Behavior Analyst Today*, *3*(4), 421–433.

Block, J. A. (2002). *Acceptance or change of private experiences: A comparative analysis in college students with public speaking anxiety*. (Unpublished doctoral dissertation*). University at Albany, Albany, USA.

Block, J. A., & Wulfert, E. (2000). Acceptance or change: Treating socially

anxious college students with ACT or CBGT. *The Behavior Analyst*

Today, *1*, 1–55.

Botella, C., Gallego, M. J., Garcia-Palacios, A., Guillen, V., Baños, R. M.,

Quero, S., & Alcañiz, M. (2010). An internet-based self-help

treatment for fear of public speaking: A controlled trial.

Cyberpsychology, Behavior and Social Networking, *13*, 407–421.

doi:10.1089/cyber.2009.0224

Cardaciotto, L., Herbert, J. D., Forman, E. M., Moitra, E., & Farrow, V.

(2008). The assessment of present-moment awareness and

acceptance: The Philadelphia mindfulness scale. *Assessment*, *15*,

204–223. doi:10.1177/1073191107311467

Carlson, L. E., & Brown, K. W. (2005). Validation of the mindful attention

awareness scale in a cancer population. *Journal of Psychosomatic*

Research, *58*(1), 29–33. doi:10.1016/j.jpsychores.2004.04.366

Cavanagh, K., Strauss, C., Forder, L., & Jones, F. (2014). Can

mindfulness and acceptance be learnt by self-help?: A systematic

review and meta-analysis of mindfulness and acceptance-based self-

help interventions. *Clinical Psychology Review*, *34*, 118–129.

doi:10.1016/j.cpr.2014.01.001

Ciarrochi, J., Robb, H., & Godsell, C. (2005). Letting a little nonverbal air

into the room: Insights from acceptance and commitment therapy

Part 1: Philosophical and theoretical underpinnings. *Journal of Rational - Emotive and Cognitive - Behavior Therapy*, *23*(2), 79–106. doi:10.1007/s10942-005-0005-y

Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. *social phobia: Diagnosis, assessment, and treatment*, *41*, 68.

Coull, G., & Morris, P. G. (2011). The clinical effectiveness of CBT-based guided self-help interventions for anxiety and depressive disorders: A systematic review. *Psychological Medicine*, *41*(11), 2239–2252. doi:10.1017/S0033291711000900

Craske, M. G. (1999). *Anxiety disorders: Psychological approaches to theory and treatment*. New York: Basic Books.

Dalrymple, K. L., & Herbert, J. D. (2007). Acceptance and commitment therapy for generalized social anxiety disorder: A pilot study. *Behavior Modification*, *31*, 543–568. doi:10.1177/0145445507302037

Daw, R. (2006). *Personal qualities of the clinical psychologist.* (unpublished doctoral dissertation*).* University of Warwick, Warwick, UK.

Dawson, D. L., Barnes-Holmes, D., Gresswell, D. M., Hart, A. J., & Gore, N. J. (2009). Assessing the implicit beliefs of sexual offenders using the implicit relational assessment procedure: A first study. *Sexual*

Abuse : A Journal of Research and Treatment, *21*(1), 57–75.

doi:10.1177/1079063208326928

De Houwer, J. (2002). The implicit association test as a tool for studying

dysfunctional associations in psychopathology: Strengths and

limitations. *Journal of Behavior Therapy and Experimental Psychiatry*,

33(2), 115–133. doi:10.1016/S0005-7916(02)00024-1

De Houwer, J. (2003). The extrinsic affective Simon task. *Experimental

Psychology*, *50*(2), 77–85. doi:10.1026//1618-3169.50.2.77

De Jong, P. J., Pasman, W., Kindt, M., & Van Den Hout, M. A. (2001). A

reaction time paradigm to assess (implicit) complaint-specific

dysfunctional beliefs. *Behaviour Research and Therapy*, *39*, 101–113.

doi:10.1016/S0005-7967(99)00180-1

Dobson, K. S., & Khatri, N. (2000). Cognitive therapy: looking backward,

looking forward. *Journal of Clinical Psychology*, *56*(7), 907–923.

Egloff, B., & Schmukle, S. C. (2002). Predictive validity of an implicit

association test for assessing anxiety. *Journal of Personality and

Social Psychology*, *83*(6), 1441–1455. doi:10.1037/0022-

3514.83.6.1441

Elliott, R. (2010). Psychotherapy change process research: realizing the

promise. *Psychotherapy Research : Journal of the Society for

Psychotherapy Research*, 20*(2), 123–135.

doi:10.1080/10503300903470743

Elliott, R., Slatick, E., & Urman, M. (2001). Qualitative change process

research on psychotherapy: Alternative strategies. In J. Frommer &

D. L. Rennie (Eds.), *Qualitative Psychotherapy Resaerch - Methods*

and Methodology (pp. 69–111). Lengerich, Germany: Pabst Science.

England, E. L., Herbert, J. D., Forman, E. M., Rabin, S. J., Juarascio, A., &

Goldstein, S. P. (2012). Acceptance-based exposure therapy for public

speaking anxiety. *Journal of Contextual Behavioral Science, 1(2),* 66-

72. doi:10.1016/j.jcbs.2012.07.001

Fawcett, S. B., & Miller, L. K. (1975). Training public-speaking behavior:

an experimental analysis and social validation. *Journal of Applied*

Behavior Analysis, 8*(2), 125–135. doi:10.1901/jaba.1975.8-125

Feldner, M. T., Zvolensky, M. J., Eifert, G. H., & Spira, A. P. (2003).

Emotional avoidance: An experimental test of individual differences

and response suppression using biological challenge. *Behaviour*

Research and Therapy, 41*(4), 403–411. doi:10.1016/S0005-

7967(02)00020-7

Feske, U., & Chambless, D. L. (1995). Cognitive behavioral versus

exposure only treatment for social phobia: A meta-analysis. *Behavior*

Therapy, 26*(4), 695–720. doi:10.1016/S0005-7894(05)80040-1

Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: exposure to corrective information. *Psychological Bulletin*, *99*, 20–35. doi:10.1037/0033-2909.99.1.20

Fox, E. (2008). Contextualistic perspectives. In M. J. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of Research on Educational Communications and Technology* (pp. 55–66). New York: Springer.

Fremouw, W. J., & Zitter, R. . (1978). A comparison of skills training and cognitive restructuring-relaxation for the treatment of speech anxiety. *Behavior Therapy*, *9*(2), 248–259.

Furmark, T., Carlbring, P., Hedman, E., Sonnenstein, A., Clevberger, P., Bohman, B., … Andersson, G. (2009). Guided and unguided self-help for social anxiety disorder: Randomised controlled trial. *British Journal of Psychiatry*, *195*(5), 440–447. doi:10.1192/bjp.bp.108.060996

Fydrich, T., Chambless, D. L., Perry, K. J., Buergener, F., & Beazley, M. B. (1998). Behavioral assessment of social performance: A rating system for social phobia. *Behaviour Research and Therapy*, *36*(10), 995–1010. doi:10.1016/S0005-7967(98)00069-2

Gallego, M, J., Emmelkamp, P, M, G., Van der Kooij, M., & Mees, H. (2011). The effects of a Dutch version of an Internet-based treatment program for fear of public speaking : A controlled study, *11*, 459–472.

Gillanders, D. T., Bolderston, H., Bond, F. W., Dempster, M., Flaxman, P. E., Campbell, L., … Remington, B. (2013). The development and initial validation of the cognitive fusion questionnaire. *Behavior Therapy*. doi:10.1016/j.beth.2013.09.001

Gloster, A. T., Hummel, K. V, Lyudminskaya, I., Hauke, C., & Sonntag, R. F. (2012). Aspects of exposure therapy in acceptance and commitment therapy. In P. Nevdeck & H. U. Wittchen (Eds.), *Exposure therapy: Rethinking the model - Refining the method* (pp. 127–152). New York: Springer.

Golijani-Moghaddam, N., Hart, A., & Dawson, D. L. (2013). The implicit relational assessment procedure: Emerging reliability and validity data. *Journal of Contextual Behavioral Science*, *2*(3-4), 105–119. doi:10.1016/j.jcbs.2013.05.002

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: attitudes, self-esteem, and stereotypes. *Psychological Review*, *102*(1), 4–27. doi:10.1037/0033-295X.102.1.4

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. (1998). *Measuring individual differences in implicit cognition: the implicit association test. Journal of personality and social psychology*, *74(6),* 1464-1480. doi:10.1037/0022-3514.74.6.1464

Hageman, W. J., & Arrindell, W. A. (1993). A further refinement of the reliable change (RC) index by improving the pre-post difference

score: Introducing RCID. *Behaviour Research and Therapy*, *31*(7), 693–700. doi:10.1016/0005-7967(93)90122-B

Harb, G. C., Eng, W., Zaider, T., & Heimberg, R. G. (2003). Behavioral assessment of public-speaking anxiety using a modified version of the social performance rating scale. *Behaviour Research and Therapy*, *41*(11), 1373–1380. doi:10.1016/S0005-7967(03)00158-X

Harris, R. (2009). *ACT made simple*. Oakland, CA: New Harbinger Publications.

Harris, S. R., Kemmerling, R. L., & North, M. M. (2002). Brief virtual reality therapy for public speaking anxiety. *Cyberpsychology & Behavior*, *5*, 543–550. doi:10.1089/109493102321018187

Hayes, S. C. (1989). *Rule-governed behaviour: Cognition, contingencies, and instructional control*. New York: Plenum.

Hayes, S. C., Barnes-Holmes, D., & Roche, B. (2001). Relational frame theory: A post-Skinnerian account of human language and cognition. *Advances in Child Development and Behavior*, *28*, 101–138. doi:10.1016/S0065-2407(02)80063-5

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*, 1–25. doi:10.1016/j.brat.2005.06.006

Hayes, S. C., & Strosahl, K. D. (2004). *A practical guide to acceptance and commitment therapy*. New York: Springer.

Hayes, S. C., Strosahl, K. D., Bunting, K., & Twohig, M. (2004). What is acceptance and commitment therapy. In S. C. Hayes & K. D. Strosahl (Eds.), *A practical guide to acceptance and commitment therapy* (pp. 3–29). New York: Springer.

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

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2012). *Acceptance and commitment therapy: The process and practice of mindful change* (2nd ed.). New York: The Guilford Press.

Hayes, S. C., Wilson, K. G., Gifford, E. V, Follette, V. M., & Strosahl, K. (1996). Experimental avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, *64*(6), 1152–1168. doi:10.1037/0022-006X.64.6.1152

Hayes, S., & Smith, S. (2005). *Get out of your mind and into your life*. Oakland, CA: New Harbinger Publications.

Hofmann, S. G., & Dibartolo, P. M. (2000). An instrument to assess self-statements during public speaking: Scale development and

preliminary psychometric properties. *Behavior Therapy*, *31*, 499–515. doi:10.1016/S0005-7894(00)80027-1

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, *59*, 12–19. doi:10.1037/0022-006X.59.1.12

Jan de Jonge, Maureen F. Dollard, Christian Dormann, Pascale M. Le Blanc, & Irene L. D. Houtman5. (2000). The demand-control model: Specific demands, specific control, and well-defined groups. *International Journal of Stress Management*, *7*(4), 269–287. doi:1072-5245/00/1000-0269/$18.00/0

Karasek, R. a. (1979). Job demands, Job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, *24*(2), 285. doi:10.2307/2392498

Kazdin, A. E. (2001). Almost clinically significant (p <.10): Current measures may only approach clinical significance. *Clinical Psychology: Science and Practice*, *8*(4), 455–462. doi:10.1093/clipsy/8.4.455

Kim, D., & Kim, D. (2003). Voluntary controllability of the implicit association test (IAT). *Social Psychology Quarterly*, *66(11),* 83-96.

Kirsch, I., & Henry, D. (1979). Self-desensitization and meditation in the reduction of public speaking anxiety. *Journal of Consulting and Clinical Psychology*, *47*(3), 536–541. doi:10.1037/0022-006X.47.3.536

Kishita, N., Muto, T., Ohtsuki, T., & Barnes-Holmes, D. (2014). Measuring the effect of cognitive defusion using the implicit relational assessment procedure: An experimental analysis with a highly socially anxious sample. *Journal of Contextual Behavioral Science*, *3*(1), 8–15. doi:10.1016/j.jcbs.2013.12.001

Lambert, M. J., & Barley, D. E. (2001). Research summary on the therapeutic relationship and psychotherapy outcome. *Psychotherapy: Theory, Research, Practice, Training*, *38*(4), 357–361. doi:10.1037//0033-3204.38.4.357

Leary, M. R. (1983). A brief version of the fear of negative evaluation scale. *Personality and Social Psychology Bulletin, 9(3),* 371-375. doi:10.1177/0146167283093007

Liebowitz, M. R. (1987). Social phobia. *Modern Problems of Pharmacopsychiatry*, *22*, 141–173.

Marshall, W. L. (1988). Behavioral indices of habituation and sensitization during exposure to phobic stimuli. *Behaviour Research and Therapy*, *26*(1), 67–77.

McCrone, P., Dhanasiri, S., Knapp, M., & Lawton-smith, S. (2008). *Paying the price: The cost of mental health care in England to 2026. the King's Fund*. Retrieved from http://www.kingsfund.org.uk/sites/files/kf/Paying-the-Price-the-cost-of-mental-health-care-England-2026-McCrone-Dhanasiri-Patel-Knapp-Lawton-Smith-Kings-Fund-May-2008_0.pdf

McGlynn, F. D., Smitherman, T. A., & Gothard, K. D. (2004). Comment on the status of systematic desensitization. *Behavior Modification*, *28*(2), 194–205. doi:10.1177/0145445503259414

McKenna, I. M., Barnes-Holmes, D., Barnes-Holmes, Y., & Stewart, I. (2007). Testing the fake-ability of the implicit relational assessment procedure (IRAP): The first study. *International Journal of Psychology and Psychological Therapy*, *7*, 253–268.

Moncher, F. J., & Prinz, R. J. (1991). Treatment fidelity in outcome studies. *Clinical Psychology Review*, *11*(3), 247–266. doi:10.1016/0272-7358(91)90103-2

Morgan, D., & Morgan, R, K. (2008). *Single case research methods for the behavioural and health sciences*. london, UK: Sage.

Mowrer, O. H. (1947). On the dual nature of learning - A reinterpretation of "conditioning" and "problem solving." *Harvard Educational Review*, *17*, 102–148.

Munder, T., Brütsch, O., Leonhart, R., Gerger, H., & Barth, J. (2013). Researcher allegiance in psychotherapy outcome research: An overview of reviews. *Clinical Psychology Review*, *33*(4), 501–511. doi:10.1016/j.cpr.2013.02.002

National institute for Health and Clinical Excellence. (2004). *Depression: Management of depression in primary and secondary care. Clinical guideline 23*. london, UK: Department of Health.

Newman, M. G., Szkodny, L. E., Llera, S. J., & Przeworski, A. (2011). A review of technology-assisted self-help and minimal contact therapies for drug and alcohol abuse and smoking addiction: Is human contact necessary for therapeutic efficacy? *Clinical Psychology Review*, *31*(1), 178–186. doi:10.1016/j.cpr.2010.10.002

Nicholas, A. L., & Maner, J. K. (2008). The good-subject effect: Investigating participant demand characteristics. *Journal of General Psychology*, *135*, 151–165.

Nicholson, E., & Barnes-Holmes, D. (2012). Developing an implicit measure of disgust propensity and disgust sensitivity: Examining the role of implicit disgust propensity and sensitivity in obsessive-compulsive tendencies. *Journal of Behavior Therapy and Experimental Psychiatry*, *43*(3), 922–30. doi:10.1016/j.jbtep.2012.02.001

Nordgreen, T., Havik, O. E., Öst, L. G., Furmark, T., Carlbring, P., & Andersson, G. (2012). Outcome predictors in guided and unguided

self-help for social anxiety disorder. *Behaviour Research and Therapy*, *50*(1), 13–21. doi:10.1016/j.brat.2011.10.009

Nosek, B. A., Hawkins, C. B., & Frazier, R. S. (2011). Implicit social cognition: From measures to mechanisms. *Trends in Cognitive Sciences, 15(4)* 152-159. doi:10.1016/j.tics.2011.01.005

Nosek, B., & Banaji, M. R. (2001). The Go/No-Go association task. *Social Cognition*, *19*, 625–666.

Orsillo, S. M., Roemer, L., Block-Lerner, J., LeJeune, C., & Herbert, J. D. (2004). ACT with anxiety disorders. In S. C. Hayes & K. D. Strosahl (Eds.), *A practical guide to acceptance and commitment therapy (pp.103-132)*. New York: Springer.

Ossman, W. A., Wilson, K. G., Storaasli, R. D., & McNeill, J. W. (2006). A preliminary investigation of the use of acceptance and commitment therapy in group treatment for social phobia. *International Journal of Psychology and Psychological Therapy*, *6*, 397–416. doi:10.1016/j.brat.2005.10.002

Ost, L. G. (1989). One-session treatment for specific phobias. *Behaviour Research and Therapy*, *27*(1), 1–7. doi:10.1016/0005-7967(89)90113-7

Ost, L.-G. (2008). Efficacy of the third wave of behavioral therapies: a
    systematic review and meta-analysis. *Behaviour Research and
    Therapy*, *46*(3), 296–321. doi:10.1016/j.brat.2007.12.005

Pavlov, I. P. (1927). *Conditioned reflexes*. london, UK: Oxford University
    Press.

Plumb, J. C., & Vilardaga, R. (2010). Assessing treatment integrity in
    acceptance and commitment therapy: Strategies and suggestions.
    International Journal of Behavioral Consultation and Therapy, *6*(3),
    263–278. doi:10.1037/h0100912

Priestley, J., Moghaddam, N., & Dawson, D. (2014). A systematic review
    of the effectiveness of psychological treatments for public speaking
    anxiety. *Manuscript in Preperation*.

Rassafiani, M., & Sahaf, R. (2010). Single case experimental design: An
    overview. *International Journal of Therapy & Rehabilitation*, *17*(6),
    285–289.

Ruscio, A. M., Brown, T. A., Chiu, W. T., Sareen, J., Stein, M. B., &
    Kessler, R. C. (2008). Social fears and social phobia in the USA:
    Results from the national comorbidity survey replication. *Psychological
    Medicine*, *38*, 15–28. doi:10.1017/S0033291707001699

Safir, M. P., Wallach, H. S., & Bar-Zvi, M. (2012). Virtual reality cognitive-behavior therapy for public speaking anxiety: One-year follow-up. *Behavior Modification, 36,* 235-246. doi:10.1177/0145445511429999

Sanne, B., Mykletun, A., Dahl, A. a., Moen, B. E., & Tell, G. S. (2005). Testing the job demand-control-support model with anxiety and depression as outcomes: The Hordaland health study. *Occupational Medicine*, *55*(6), 463–473. doi:10.1093/occmed/kqi071

Sharp, K. (2012). A Review of Acceptance and Commitment Therapy with Anxiety Disorders. *International Journal of Psychology and Psychological Theory, 88*, 359–372.

Skinner, B. F. (1974). *About behaviourism*. New York: Random House, Inc.

Smith, J. D. (2012). Single-case experimental designs: A systematic review of published research and current standards. *Psychological Methods, 17(4), 510-550*. doi:10.1037/a0029312

Solyom, L., Ledwidge, B., & Solyom, C. (1986). Delineating social phobia. *British Journal of Psychiatry*, *149*, 464–470.

Stanley, K. (2007). Design of randomized controlled trials. *Circulation*, *115*(9), 1164–1169. doi:10.1161/CIRCULATIONAHA.105.594945

Stein, M. B., Walker, J. R., & Forde, D. R. (1994). Setting diagnostic thresholds for social phobia: Considerations from a community survey of social anxiety. *American Journal of Psychiatry*, *151*(3), 408–412.

Tillfors, M., & Furmark, T. (2007). Social phobia in Swedish university students: Prevalence, subgroups and avoidant behavior. *Social Psychiatry and Psychiatric Epidemiology*, *42*(1), 79–86. doi:10.1007/s00127-006-0143-2

Trompetter, H. R., Ten Klooster, P. M., Schreurs, K. M. G., Fledderus, M., Westerhof, G. J., & Bohlmeijer, E. T. (2013). Measuring values and committed action with the engaged living scale (ELS): Psychometric evaluation in a nonclinical sample and a chronic pain sample. *Psychological Assessment*, *25*, 1235–46. doi:10.1037/a0033813

Vahey, N. A., Barnes-Holmes, D., Barnes-Holmes, Y., & Stewart, I. (2010). A first test of the implicit relational assessment procedure as a measure of self-esteem: Irish prisoner groups and university students. *The Psychological Record*, *59*(3), 371–388. doi:10.1007/s40732-014-0022-2

Van der Doef, M., & Maes, S. (1999). The job demand-control (Support) model and psychological well-being: A review of 20 years of empirical research. *Work & Stress*, *13*(2), 87–114. doi:10.1080/026783799296084

Vasey, M. W., Harbaugh, C. N., Buffington, A. G., Jones, C. R., & Fazio, R. H. (2012). Predicting return of fear following exposure therapy with an implicit measure of attitudes. *Behaviour Research and Therapy*, *50*(12), 767–774. doi:10.1016/j.brat.2012.08.007

Vrielynck, N., & Philippot, P. (2009). Regulating emotion during imaginal exposure to social anxiety: Impact of the specificity of information processing. *Journal of Behavior Therapy and Experimental Psychiatry*, *40*(2), 274–282. doi:10.1016/j.jbtep.2008.12.006

Wallach, H. S., Safir, M. P., & Bar-Zvi, M. (2009). Virtual reality cognitive behavior therapy for public speaking anxiety: A randomized clinical trial. *Behavior Modification*, *33*, 314–338. doi:10.1177/0145445509331926

Wells, A. (1997). *Cognitive therapy of anxiety disorders: A practice manual and conceptual guide*. Chichester, UK: Wiley.

Wenzlaff, R. M., & Wegner, D. M. (2000). Thought suppression. *Annual Review of Psychology*, *51*, 59–91. doi:10.1146/annurev.psych.51.1.59

Wicksell, R. K., Olsson, G. L., & Hayes, S. C. (2010). Psychological flexibility as a mediator of improvement in acceptance and commitment therapy for patients with chronic pain following whiplash. *European Journal of Pain (London, England)*, *14*(10), 1059.e1–1059.e11. doi:10.1016/j.ejpain.2010.05.001

Wise, E. A. (2004). Methods for analyzing psychotherapy outcomes: A review of clinical significance, reliable change, and recommendations for future directions. *Journal of Personality Assessment*, *82*(1), 50–59. doi:10.1207/s15327752jpa8201_10

Wolpe, J. B. (1958). *Psychotherapy by reciprocal inhibition*. Stanford: Stanford University Press.

Wright, J. C. (1976). A comparison of systematic desensitization and social skill acquisition in the modification of a social fear. *Behavior Therapy*, *7*(2), 205–210. doi:10.1016/S0005-7894(76)80277-8

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Information Sheet

The study will investigate the effectiveness of Acceptance and Commitment Therapy (ACT) to treat Public Speaking Anxiety (PSA). Evidence suggests that ACT may reduce a person's anxiety associated with public speaking; however existing research is in the early stages. ACT is a third wave Cognitive Behavioural Therapy (CBT) that uses a range of techniques to aid individuals to accept uncomfortable emotions and feelings, whilst simultaneously moving towards what they value most in life.

The study will further investigate the use of ACT to treat PSA with the use of the self-help workbook 'Get out of your Mind and into your Life', to examine if using this self-help guide will increase the chance of participants approaching a feared public speaking scenario and reduce their anxiety associated with a public speaking task. The study will also investigate at which points changes occur during the intervention. This will help us understand which elements of ACT appear to be useful when treating PSA. The study will achieve this by requesting that participants complete daily and weekly questionnaires, as well as a battery of measures including a computerised exercise at the start, middle, and end of the ACT intervention. Participants will be required to complete chapters and workbook tasks with regular telephone support from the researchers. Participants will also be given the option to complete a five to ten minute talk on a chosen subject at the end of the intervention. This talk will be to a small audience of Clinical Psychologists and trainee Clinical Psychologists, as well as the researchers involved in the study. As existing research has shown that changes may occur after the ACT intervention, a final element of the study will be a change interview conducted one-month after the intervention by an independent researcher. Participants will be compensated for their time by accruing £4.00 for every week of the study completed (measured by the number of chapters and self-reported measures completed) and a further £4.00 on completion of the final interview. As the intervention stage requires participants to read the self-help workbook for 6 weeks, participants will be compensated £28 in total on completion of the study. Should participants choose to withdraw before completing all stages of the study, they will be compensated for the time they have invested (measured by the number of chapters and self-

reported measures completed) and can choose if they wish for their data to be removed or remain in the study.

Therefore, the responsibility of the participant will be:

1. To complete a battery of assessments at the start, middle, and end of the study.
2. To complete a daily questionnaire and weekly questionnaires during completion of the workbook (Completion of the workbook will take a minimum of six weeks) with regular contact (once a week) with a researcher.
3. To give a five - ten minute talk to a small audience after completing the workbook (**optional**).
4. To attend a meeting with an independent researcher one-month following the intervention.

If you have any further questions after reading this information sheet, or would like to discuss any concerns, then please contact me via e-mail on: 13451707@students.lincoln.ac.uk

If you have concerns regarding the ethical practice or conduct of this study, please contact the Lincoln University Ethics Committee: soprec@lincoln.ac.uk

Appendix B:

Weekly Questionnaire

Acceptance (PHLMS)

* 1. Please read the following statements and indicate how often they were true for you **in the past week**

	Never	Rarely	Sometimes	Often	Very Often
I am aware of thoughts I am having when my mood changes	○	○	○	○	○
When talking with other people, I am aware of the emotions I am experiencing	○	○	○	○	○
When someone asks how I am feeling, I can identify my emotions easily	○	○	○	○	○
I try to put my problems out of mind	○	○	○	○	○
I tell myself that I shouldn't feel sad	○	○	○	○	○
When I shower, I am aware of how the water is running over my body	○	○	○	○	○
Whenever my emotions change, I am conscious of them immediately	○	○	○	○	○
There are things I try not to think about	○	○	○	○	○
I am aware of what thoughts are passing through my mind	○	○	○	○	○
I tell myself that I shouldn't have certain thoughts	○	○	○	○	○
I try to distract myself when I feel unpleasant emotions	○	○	○	○	○
There are aspects of myself I don't want to think about	○	○	○	○	○
I wish I could control my emotions more easily	○	○	○	○	○
When I walk outside, I am aware of smells, or how the air feels against my face	○	○	○	○	○
I notice changes in my body, like my heart beating faster or my muscles getting tense	○	○	○	○	○
When talking to other people, I am aware of their facial and body expressions	○	○	○	○	○
When I am startled, I notice what is going on inside my body	○	○	○	○	○
I try to stay busy to keep thoughts or feelings from coming to mind	○	○	○	○	○
If there is something I don't want to think about, I will try many things to get it out of my mind	○	○	○	○	○

Cognitive Fusion (CFQ)

* 1. Please read the following statements and indicate how often they were true for you in the past week

	Never True	Very seldom True	Seldom True	Infrequently True	Frequently True	Almost always True	Always True
Even when I'm having upsetting thoguhts, I can see that those thoughts may not be literally true	○	○	○	○	○	○	○
Even when I am having distressing thoughts, I know that they will become less important eventually	○	○	○	○	○	○	○
I over-analyse situations to the point it's unhelpful to me	○	○	○	○	○	○	○
My thoughts cause me distress or emotional pain	○	○	○	○	○	○	○
I tend to get very entangled in my thoughts	○	○	○	○	○	○	○
It is possible for me to have negative thoughts about myself and still know that I am an OK person	○	○	○	○	○	○	○
I get so caught up in my thoughts that I am unable to do the things I most want to do	○	○	○	○	○	○	○
I need to control the thoughts that come into my head	○	○	○	○	○	○	○
I get upset with myself for having certain thoughts	○	○	○	○	○	○	○
I find it easy to view my thoughts from a different perspective	○	○	○	○	○	○	○
It's such a struggle to let go of upsetting thoughts, even thoguh I know letting go would be helpful	○	○	○	○	○	○	○
I tend to react very strongly to my thoughts	○	○	○	○	○	○	○
I struggle with my thoughts	○	○	○	○	○	○	○

Present-moment Awareness (MAAS)

* 1. Below is a collection of statements about your everyday experience. Please indicate how frequently or infrequently you have experienced each <u>in the past week</u>. Please answer according to what really reflects your experience rather than what you think your experience should be.

	Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never
I could be experiencing some emotion and not be conscious of it until some time later	○	○	○	○	○	○
I find myself preoccupied with the future or the past	○	○	○	○	○	○
I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there	○	○	○	○	○	○
I drive to places on "automatic pilot" and then wonder why I went there	○	○	○	○	○	○
I snack without being aware that I'm eating	○	○	○	○	○	○
I break or spill things because of carelessness, not paying attention or thinking of something else	○	○	○	○	○	○
I find it difficult to stay focused on whats happening in the present	○	○	○	○	○	○
I rush through activities without being really attentive to them	○	○	○	○	○	○
I tend not to notice feelings of physical tension or discomfort untill they really grab my attention	○	○	○	○	○	○
I find myself listening to someone with one ear, whilst doing something else at the same time	○	○	○	○	○	○
I forget a person's name almost as soon as I've been told it for the first time	○	○	○	○	○	○
I do jobs and tasks automatically, without being aware of what I'm doing	○	○	○	○	○	○
It seems like I am "running on automatic," without much awareness of what I'm doing	○	○	○	○	○	○
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way	○	○	○	○	○	○
I find myself doing things without paying attention	○	○	○	○	○	○

Values and Committed Action (ELS)

* 1. The following statements concern 'value based living.' Values are the choices that we make about how we want to live our lives. This means that you determine what you believe to be important in your life, what makes it all worthwhile and what motivates you. The question that you ask yourself here is what do I want from life? What do I consider important and what sort of person do I want to be? This questionnaire is about identifying these values and whether you live according to them. Please complete these statements based on your experiences <u>in the past week</u>.

	Completely Disagree	Disagree	Not Sure	Agree	Completely Agree
I believe that I am living life to the full right now	○	○	○	○	○
I feel that I am living a full life	○	○	○	○	○
I make time for the things that I consider important	○	○	○	○	○
I make choices based on my values, even if it is stressful	○	○	○	○	○
I have values that give my life more meaning	○	○	○	○	○
I know how I want to live my life	○	○	○	○	○
I am satisfied with how I live my life	○	○	○	○	○
I believe that I've found important values to live according to	○	○	○	○	○
My emotions don't hold me back from doing what's important to me	○	○	○	○	○
I believe that my values are really reflected in my behaviour	○	○	○	○	○
I know exactly what I want to do with my life	○	○	○	○	○
I know what motivates me in life	○	○	○	○	○
I know what I want to do with my life	○	○	○	○	○
Nothing can stop me from doing something that's imprtant to me	○	○	○	○	○
I believe that how I behave fits in with my personal wants and desires	○	○	○	○	○
I live the way I always intended to live	○	○	○	○	○

Public Speaking Anxiety (SSPS)

* 1. Please imagine what you have typically felt and thought to yourself during any kind of public speaking situations <u>this week</u>**. Imagining these situations, how much do you agree with the statements given below. Please rate the degree of your agreement on a scale between 0 (if you do not agree at all) to 5 (if you agree extremely with the statement).**

	I don't agree at all (0)	(1)	(2)	(3)	(4)	I agree extremely (5)
I'll probably "bomb out" anyway	○	○	○	○	○	○
A failure in this situation would be more proof of my incapacity	○	○	○	○	○	○
Instead of worrying I could concentrate on what I want to say	○	○	○	○	○	○
I feel awkward and dumb; they're bound to notice	○	○	○	○	○	○
I can handle everything	○	○	○	○	○	○
What I say will probably sound stupid	○	○	○	○	○	○
Even if things don't go well, it's no catastrophe	○	○	○	○	○	○
I'm a loser	○	○	○	○	○	○
This is an awkward situation but I can handle it	○	○	○	○	○	○
What do I have to lose; it's worth a try	○	○	○	○	○	○

Distress, willingness, and Avoidance of Idiographic Feared Public Speaking Situation (SUDS)

* 1. Imagine you are stood up on stage in a large lecture hall giving a planned speech to a group of around 50 peers. They are talking and giggling with each other but look miserable. You have a microphone. You are not using a computer, and you are talking about a topic you don't know very well.

	0	10	20	30	40	50	60	70	80	90	100
Rate how much you would avoid this situation (100 being complete avoidance, 0 being no avoidance)	○	○	○	○	○	○	○	○	○	○	○
Rate how willing you would be to be in this situation (100 being the highest level of willingness, 0 being the lowest)	○	○	○	○	○	○	○	○	○	○	○
Rate how much distress this situation would make you feel out of 100 (100 being the highest level of distress, while 0 is no distress)	○	○	○	○	○	○	○	○	○	○	○

You have now completed the weekly measures!

Appendix C:

*Daily Questionnaire*

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* 1. Thinking back over your experiences <u>today</u>, please rate your agreement with the following statements:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
There were things I tried not to think about	○	○	○	○	○
I found it difficult to stay focused on what was happening in the present	○	○	○	○	○
My thoughts caused me distress or emotional pain	○	○	○	○	○
It seemed I was 'running on automatic' without much awareness of what I was doing	○	○	○	○	○
I found myself doing things without paying attention	○	○	○	○	○
I made choices based on my own values even if it was stressful	○	○	○	○	○
How I behaved fit with my personal wants and desires	○	○	○	○	○
My values were really reflected in my behaviour	○	○	○	○	○
I got so caught up in my thoughts that I was unable to do the things that I most wanted to do	○	○	○	○	○
I tried to stay busy to keep thoughts or feelings from coming to mind	○	○	○	○	○
I got very entangled in my thoughts	○	○	○	○	○
I tried to distract myself when I felt unpleasant emotions	○	○	○	○	○
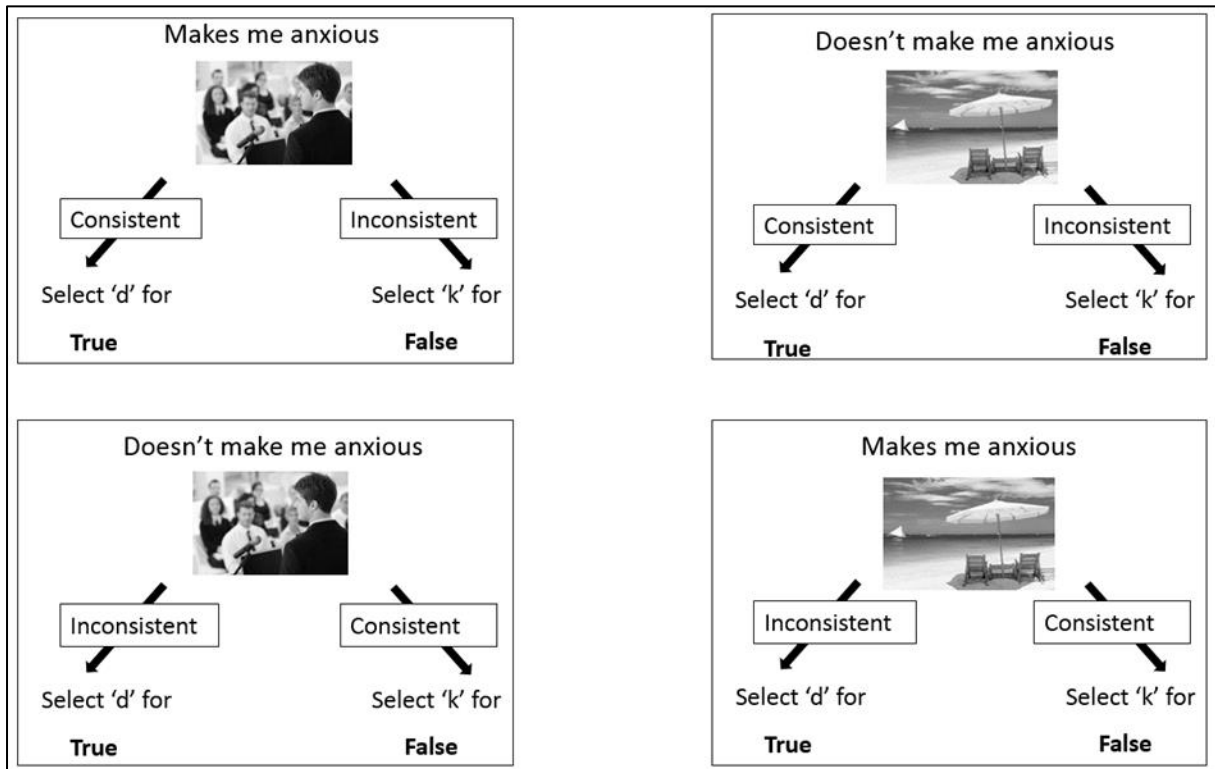
Note: The arrows denote the responses that were consistent and inconsistent for an individual with PSA. These were not visible on the screen during the task. If the participant chose a consistent response during a consistent trial block, and an inconsistent response during an inconsistent trial block, then the next trial was present in 400 milliseconds. Conversely, if the participant chose an inconsistent response during a consistent trial block, and a consistent response during an inconsistent trial block, an "X" appeared on the screen until the correct response was chosen.

Appendix E:

Parameters Considered when Visually Analysing the Daily Time-series Data (Psychological Flexibility)
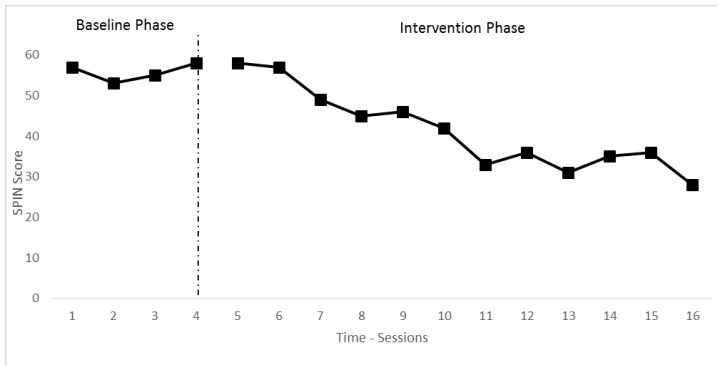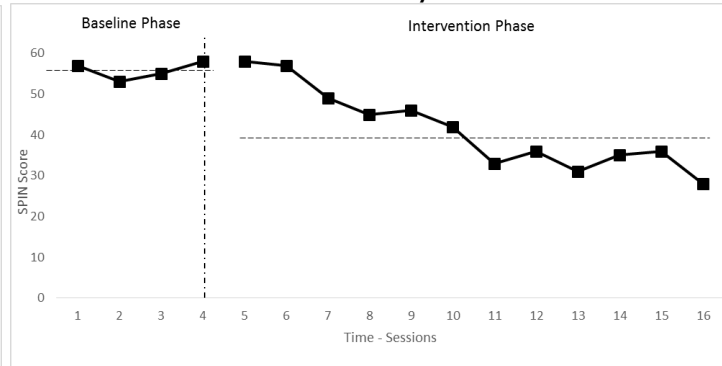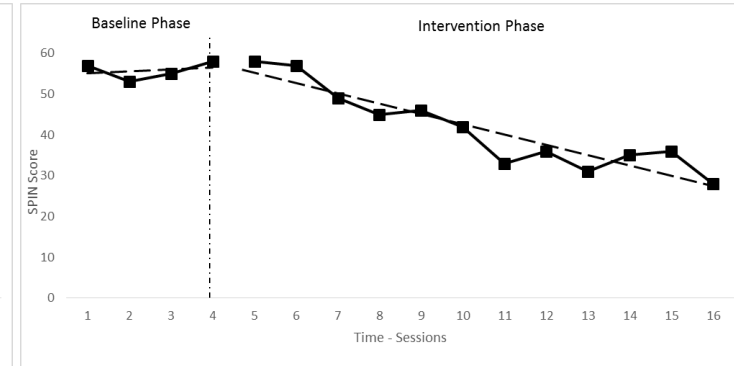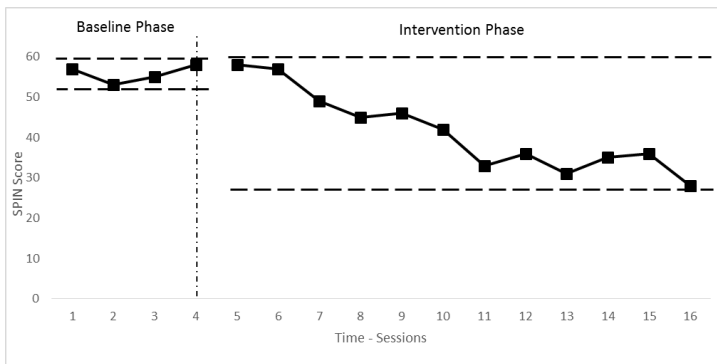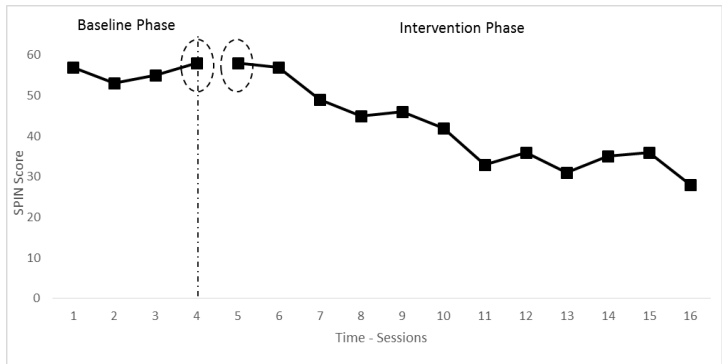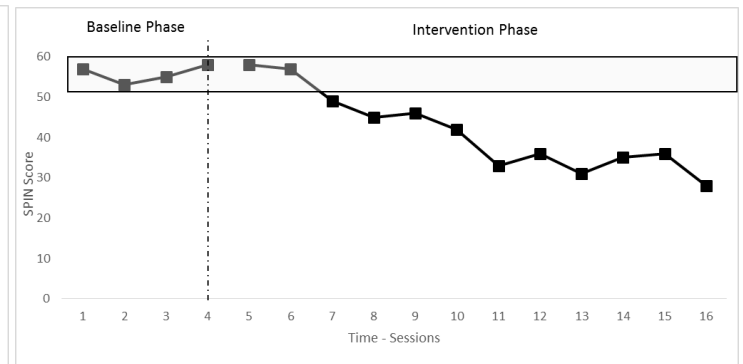
Change Interview Schedule

Change interview
(*Introduce self and remind participant about confidentiality*)

- Can you please tell me how you found the intervention / workbook?
- Was the book easy to read and understand? (If not, why?)
- Would you recommend this book to others?
- Were there any chapters in the book you found helpful?
- What would you say has changed for you?
- In your opinion were these positive or negative changes?
- Can you rate how surprised you were by these changes on the following five point scale from 1 (not surprised by the changes) to 5 (surprised by the changes)?

1	2	3	4	5
Not surprised by the changes		Neutral		Surprised by the changes

- Please rate how likely it is that these changes were a result of reading the workbook 1 (not likely) to 5 (likely)?

1	3	5
Not likely	Neutral	Likely

- Rate the importance of these changes on a five point scale from 1 (not important) to 5 (important)?

1	3	5
Not important	Neutral	Important

- Have you noticed a change in your fear of public speaking? And if so, it what area? (Willingness to approach, distress during, avoidance of?).
- Did you decide to take part in the public speaking task? (If not, why not / if so, how did you find it?)

- Did you deliver any public speeches during the intervention?
- Did any external events occur during the study time period? (In the areas of work or relationships etc. for example). If so, do you think this may have had an effect?
- Can you tell me how you found the researcher support?
- Any additional comments?

Appendix G:

Confirmation of Ethical Approval

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22nd December 2015

TO WHOM IT MAY CONCERN

This is to confirm that Joe Priestley's ethical approval for *"Acceptance and Commitment Therapy for Public Speaking Anxiety – a Case Series Study of Effects on Self-reported, Implicit, Imaginal, and In-vivo Performance"* was considered and approved by the October 2014 committee of SOPREC.

If you have any queries about the ethical approval, please email soprec@lincoln.ac.uk, alternatively call 01522 835510

Kind regards

Dr Patrick Bourke PP.
Chair of School of Psychology Research Ethics Sub Committee

pp: By Zoë Mead, Officer of Chair of School of Psychology Research Ethics Sub Committee

Title of Study: **Acceptance and Commitment Therapy for Public Speaking Anxiety – a Case Series Study of Effects on Self-reported, Implicit, Imaginal, and In-vivo Outcomes**

Name of Researcher: Joe Priestley

Name of Participant:

Please initial box

1.   I confirm that I have read and understood the information sheet for the above study 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, and without my medical care or legal rights being affected. I understand that I have the right to withdraw my data from the study within two weeks of either completing or withdrawing from participation, however, should I withdraw, my data can still be used if I wish.

3.   I understand that data collected in the study may be looked at by authorised individuals from the University of Nottingham and Lincoln, the research group and regulatory authorities where it is relevant to my taking part in this study. I give permission for these individuals to collect, store, analyse and publish information obtained from my participation in this study. I understand that my personal details will be kept confidential.

4.   I understand that I will be compensated for taking part in this research incrementally, and will accrue £4.00 per week of the intervention (according to the number of chapters and self-reported measures completed) and an additional £4.00 on completion of the final change interview; £28 in total. If I choose to withdraw from the study early, then I will be compensated for the number of weeks I have taken part (according to the chapters and self-reported measures completed).

5.   I understand that telephone contact with the researcher may be recorded in order for treatment fidelity checks to be completed.

6.   I understand that the final public speaking task is voluntary.

7.   I agree to take part in the above study.

_____   _____   _____
Name of Participant   Date   Signature

_____   _____   _____
 Name of Person taking consent   Date   Signature
 (if different from Principal Investigator)

_____   _____   _____
Name of Principal Investigator   Date   Signature

2 copies: 1 for participant and 1 for the project notes

*If you have concerns regarding the ethical practice or conduct of this study, please contact the Lincoln University Ethics Committee: soprec@lincoln.ac.uk

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Appendix I:

Public Speaking Image Selection

Appendix J:

Feared Public Speaking Situation Questionnaire Used for the Imagined Task

Please complete the sentences below according to how you truly feel when delivering a speech or giving a talk in front of others. Suggested options are provided, however, please complete the sentence according to what most reflects your opinion.

1. I most fear talking in front of .... (e.g., family, friends, people I know, people I don't know, assessors....)
2. It causes me anxiety to talk to .... groups of people (e.g., small, quite large, large, extremely large.......)
3. I find it anxiety provoking to give a speech / talk in front of ....(e.g., under 10 people, between 10 - 30 people, between 30 - 50 people, between 50 - 100 people, over 100 people......)
4. It makes me anxious talking in front of people when I'm ....(e.g., in a small room, in a large room, in a lecture hall, in a meeting room, on a stage, behind a lectern.......)
5. It distresses me most when the speech / talk is ....(e.g., planned, unplanned, partially planned..................)
6. It makes me most distressed when I have to talk .... (e.g., with audio aids - microphone, without audio aids - having to project voice........)
7. It stresses me out when I know the speech / talk is ....(e.g., being assessed, not being assessed, being marked as I speak...........)
8. I find it distressing when I see people .... during a speech / talk I'm giving (e.g., not looking at me, looking at me, whispering to each other, talking to each other, giggling with each other, sitting in silence........)
9. I find it causes me to panic when I look up and see that people are .... (e.g., smiling, frowning, looking angry, looking sad, looking miserable, looking excited, looking anxious........)
10. I feel most distressed when the speech is to do with my ....(e.g., working life, personal life, both work and personal life.......)
11. I feel extremely anxious when I .... when giving a talk (e.g., use a computer - power-point, use hand-outs, don't use a computer, don't use hand-outs........)

12. It makes me feel anxious when the location I am talking in is …………………..(e.g., extremely noisy, quite noisy, quite quiet, extremely quiet……..)

13. I become anxious if I am talking about a topic ………………… (e.g., I know really well, I know fairly well, I don't really know much about, I know nothing about……..)

14. I find myself getting anxious during a talk / speech if I'm ……………… (e.g., sat down, stood up, above the audience, below the audience……..)

15. I feel most anxious when giving a speech / talk during the …………………..(e.g., early morning, morning, mid-day, afternoon, early evening, late evening, any time……..)

16. Please add any additional situations and/or factors that increase your fear whilst giving a speech or talk in front of others.

ACT for Public Speaking Anxiety – A Case Series Study of Effects on Self-reported, Implicit, Imaginal, and In-vivo Outcomes

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Trent Doctorate in Clinical Psychology

Background

Public speaking anxiety (PSA) is a common problem that affects a large proportion of the population. The distress caused by PSA appears to lie on a continuum.[1] For some, PSA can cause functional impairments in areas of work, and social life.[2] Although treatment in the form of exposure combined with cognitive restructuring yields a large effect size, around 25% of patients fail to respond to this form of treatment,[3] possibly due to their use of avoidance strategies that inhibit the habituation process.[4]

Acceptance and Commitment Therapy (ACT) offers an alternative treatment option for those with PSA, as ACT fosters willingness to approach previously feared contexts whilst encouraging mindfulness, and psychological flexibility, allowing for habituation to take place.

Initial ACT research is promising in the field of anxiety, however, only a limited/inconclusive evidence base exists for the efficacy of ACT to treat PSA,[5] with an overreliance on group studies and trials not designed to tease out mediating processes.

The present study

This study investigated whether a self-help ACT intervention reduced participants' PSA, and if so, which ACT processes were responsible for these reductions; using a single case experimental design.

This study recorded participants' distress related to public speaking using self-reported measures, an implicit measure, and responses to an imaginal public speaking scenario. Willingness to complete a final in-vivo speech task was also assessed. Additionally, each participant completed a daily ACT process measure that enabled us to investigate the likely mechanisms of change involved in ACT to treat PSA.

The inclusion of the Implicit Relation Assessment Procedure (IRAP;[6]) also allowed us to investigate whether changes in implicit beliefs were needed to reduce PSA as measured by self-reports and the final behavioural approach task.

Method

Participants were recruited from the University of Lincoln.

Participants scoring above a minimum cut-off on a measure of PSA, not receiving psychopharmacological intervention, with a willingness to read an ACT self-help book over the course of six weeks were eligible to take part.

Six participants completed a battery of assessments before beginning the baseline phase. Once a stable baseline was achieved, participants completed a collection of chapters from the workbook 'Get out of Your Mind and into Your Life'[7] pertaining to each ACT process over the course of six weeks, whilst completing daily and weekly measures. A further battery of tests were also administered at the mid-point and end of the intervention (including the IRAP).

Participants were invited to take part in a final public speaking task to assess willingness and speech performance.
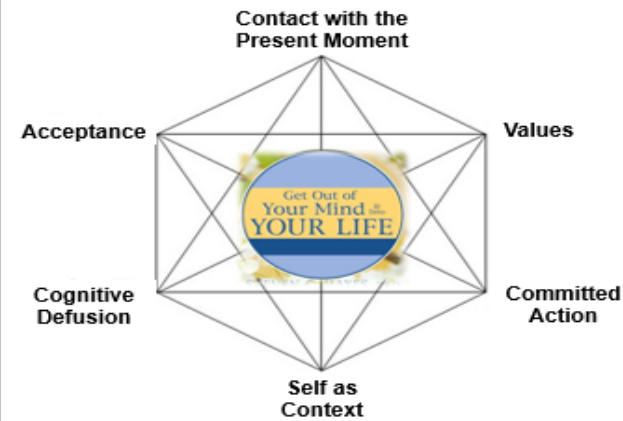

Results

All the participants reported a reduction in PSA as measured by the primary self-report. This reduction was deemed reliable in three cases, and clinically significant in two.

Four participants reported increases in willingness to approach their most feared public speaking scenario. These participants also went on to complete an impromptu public speaking task and received above average audience observer-ratings.

Analysis of the daily time-series data, ACT processes, and feedback from the participants indicated that the ACT process of mindfulness (self-as-context, and present-moment awareness) may be a key mechanism of change in ACT for PSA.
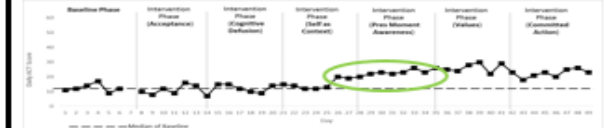
The findings from the IRAP were mixed, suggesting future research may need to focus on measuring second-order, rather than first-order change.

Implications

Self-help ACT may be a cost-effective way in which to treat PSA, especially for individuals who find exposure-based treatments ineffective.
Developing present-moment awareness may be important in successful treatment for PSA, however, further research is needed to verify this claim using a wider sample.

References:
1. Bogels SM, Alden L, Beidel DC, Clark LA, Pine DS, Stein MB, et al. Social anxiety disorder: Questions and answers for the DSM-V. [Internet]. Depression and Anxiety. 2010. p. 168–89. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc6&NEWS=N&AN=2010-04251-006
2. Aderka IM, Hofmann SG, Nickerson A, Hermesh H, Gilboa-Schechtman E, Marom S. Functional impairment in social anxiety disorder. Journal of Anxiety Disorders. 2012. p. 393–400.
3. Dalrymple KL, Herbert JD. Acceptance and commitment therapy for generalized social anxiety disorder: a pilot study. Behav Modif. 2007;31:543–68.
4. Foa EB, Kozak MJ. Emotional processing of fear: exposure to corrective information. Psychol Bull. 1986;99:20–35.
5. Block JA, Wulfert E. Acceptance or change: Treating socially anxious college students with ACT or CBGT. Behav Anal Today. 2000;1:1–55.
6. Barnes-Holmes D, Murphy A, Barnes-Holmes Y, Stewart I. The Implicit Relational Assessment Procedure: Exploring the impact of private versus public contexts and the response latency criterion on pro-white and anti-black stereotyping among white Irish individuals. Psychol Rec. 2011;60(1):4.
7. Hayes S, Smith S. Get Out of Your Mind and Into Your Life. Oakland, CA: New Harbinger Publications; 2005.
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