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**Comparing the Effectiveness of Thought Suppression and  
Cognitive Defusion in managing Obsessional Intrusive Thoughts**

AND CLINICAL RESEARCH PORTFOLIO  
VOLUME I

(VOLUME II bound separately)

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*Submitted in partial fulfilment of the requirements for the degree  
of Doctorate in Clinical Psychology (D Clin Psy)*

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## Table of Contents Volume I

<b>Chapter One: Systematic Review</b>	<b>1-33</b>
A Systematic Review of component studies evaluating the effects of cognitive defusion on distress and believability	
<b>Chapter Two: Major Research Project</b>	<b>34-66</b>
Comparing the Effectiveness of Thought Suppression and Cognitive Defusion in Managing Obsessional Intrusive Thoughts	
<b>Chapter Three: Advanced Clinical Practice I. Reflective Account (Abstract Only)</b>	<b>67-68</b>
Reflections on my use of time management - <i>“A man who dares to waste one hour of life has not discovered the value of life” (Charles Darwin)</i>	
<b>Chapter Four: Advanced Clinical Practice II. Reflective Account (Abstract Only)</b>	<b>69-71</b>
“Ready, Steady, Cook” - A trainee on the brink of qualification	
<b>Appendices</b>	<b>71-103</b>
<b>Systematic Review</b>	
Appendix 1.1 Submission Guidelines	<b>71</b>
Appendix 1.2 Quality Rating Tool	<b>72</b>
Appendix 1.3 Study Scoring Sheet	<b>73</b>
<b>Major Research Proposal</b>	
Appendix 2.1 Letter of Ethical Approval	<b>74</b>
Appendix 2.2 Email Advertisement for Recruitment Purposes	<b>75</b>
Appendix 2.3 Participant Information Sheet	<b>76</b>
Appendix 2.4 Consent Form	<b>79</b>
Appendix 2.5 VAS Appraisals Questionnaire	<b>80</b>
Appendix 2.6 Daily Diary	<b>82</b>
Appendix 2.7 Description of an Intrusive Thought	<b>84</b>
Appendix 2.8 Target Thought Monitoring Instructions	<b>85</b>
Appendix 2.9 Cognitive Defusion Experimental Instructions	<b>86</b>
Appendix 2.10 Suppression Experimental Instructions	<b>87</b>
Appendix 2.11 Research Proposal	<b>88</b>

## **Table of Contents**

### **Volume II (Bound Separately)**

#### **Chapter One: Advanced Clinical Practice I - Reflective Account 3-11**

Reflections on my use of time management - *“A man who dares to waste one hour of life has not discovered the value of life” (Charles Darwin)*

#### **Chapter Two: Advanced Clinical Practice II - Reflective Account 12-21**

“Ready, Steady, Cook” - A trainee on the brink of qualification

## CHAPTER ONE: SYSTEMATIC REVIEW

### **A Systematic Review of component studies evaluating the effects of cognitive defusion on distress and believability**

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## **Abstract**

**Background:** Cognitive defusion is a core therapeutic process in Acceptance and Commitment Therapy (ACT). ACT helps clients distance themselves from cognitive content that functions as a barrier to pursuing valued behavioural directions. This systematic review focuses on cognitive defusion techniques that use deliteralisation to try to reduce the literal quality of thoughts and help individuals see them as just thoughts rather than absolute truths.

**Aims:** To synthesise experimental findings regarding the effects of cognitive defusion on distress and believability in experimental laboratory-based component studies.

**Method:** A systematic literature search was conducted in June 2013 using CINAHL, EMBASE, MEDLINE, PsychINFO, Web of Science, and the Cochrane Library databases to identify relevant studies.

**Results:** Nine studies met inclusion criteria for review. The majority of studies (i.e. 7) were rated “moderate” in quality, the remaining two were rated “good” and “low”. Cognitive defusion was generally shown to produce superior results to distraction, imaginal exposure, and control conditions, and similar results to cognitive restructuring and thought suppression. The studies reviewed also reported findings about potential moderator variables, namely the use of experiential exercises and the duration of cognitive defusion techniques.

**Conclusions:** Given the promising findings in relation to cognitive defusion and the dearth of research in this area, it would seem that further research into this therapeutic technique is warranted.

**Keywords:** Cognitive defusion; Acceptance and Commitment Therapy; Deliteralisation



## **1. Introduction**

Acceptance and Commitment Therapy (ACT) is a third-wave cognitive behavioural therapy. Its main aim is to increase psychological flexibility. This is the ability to contact the present moment more fully as a conscious human being, and to change or continue with behaviour that serves valued life goals. Six core ACT processes establish psychological flexibility. They are called acceptance, cognitive defusion, contact with the present moment, self as context, values, and committed action. Acceptance or willingness means opening up and making room for painful feelings and sensations. Instead of struggling with them, we let them be. Contact with the present moment means consciously paying attention to the here-and-now instead of drifting off into our thoughts or operating on automatic pilot. Self-as-context involves developing a sense of self as observer that is stable and independent of the changing experiences of each moment. The values process is defining what is most important in our life. Committed action means taking effective action, guided by our values (Harris, 2009).

This only leaves cognitive defusion, which is the focus of the systematic review. ACT states that the modification of problematic psychological content (e.g. thoughts) in function, and not in form or frequency, is the aim of treatment (Hayes, Strosahl, & Wilson, 1999). From an ACT perspective, clients are frequently fused with painful or negatively evaluated psychological content and defusion strategies aim to create a defused perspective that allows greater behavioural flexibility. Fusion means getting caught up in our thoughts and allowing them to dominate our behaviour. Defusion means separating or distancing from our thoughts, letting them come and go instead of getting caught up in them. The aim of cognitive defusion is to see the true nature of thoughts and mental images as nothing more or less than words or pictures and to respond to them in terms of workability rather than literality (i.e. how helpful they are rather than how true they are) (Harris, 2009). ACT helps clients in defusing from cognitive content that functions as a barrier to pursuing valued behavioural directions (Flaxman, Blackledge, & Bond, 2011). The primary question the client should be asking is whether “buying” a thought would move the client towards a life in line with his or her chosen values or whether it moves the client in some other direction (Luoma & Hayes, 2008).

There are currently well over a hundred cognitive defusion techniques documented in ACT books, and many more that have not been written up (Harris, 2009). The strategy with the most empirical support is Titchener's repetition technique, a vocalising technique, which involves saying a word aloud over and over again with increasing rapidity for a period of about 20-30 seconds (Hinton & Gaynor, 2010). Titchener (1916) argued that when a word was said aloud over and over again, the context for words to have literal meaning was removed. Within ACT, clients might be encouraged to repeat negative words rapidly (e.g. "stupid, stupid, stupid..."). Clients have reported that towards the end of the exercise, they experienced the words simply as a strange sound (Hayes, Strosahl, & Wilson, 1999). The therapist then uses this experience to highlight that the client's negative thought content is purely verbal and not a reflection of reality.

Although cognitive defusion strategies are frequently used within an ACT-based clinical context, the empirical evidence to support their efficacy is relatively limited (Healy et al. 2008). Studies examining the impact of a particular psychotherapy technique in isolation are quite rare but there are some experimental analogue studies of defusion (Luoma & Hayes, 2008).

As mentioned above, there are many different types of cognitive defusion techniques. This systematic review focuses on deliteralisation techniques that try to reduce the literal quality of thoughts and help individuals see them as just thoughts rather than absolute truths. It excludes metaphorical and meditative-type techniques (e.g. "Leaves on a Stream") about letting thoughts come and go or taking a non-judgmental stance in relation to thoughts, as these techniques overlap with the other core ACT processes of acceptance and contact with the present moment. Furthermore, in recent years, a number of related concepts and procedures have emerged that have similar goals to cognitive defusion, such as metacognitive strategies (Luoma & Hayes, 2008). This review will, however, focus on the use of cognitive defusion within an ACT context.

Three previous reviews were identified that examined component parts of ACT interventions (Hayes Luoma, Bond, Masuda, & Lillis, 2006; Ruiz, 2010; Levin, Hildebrandt, Lillis, & Hayes, 2012). The most recent of these (Levin, Hildebrandt, Lillis, & Hayes, 2012) was a meta-analysis of 66 laboratory-based component studies evaluating treatment elements and processes suggested by the psychological flexibility model underlying ACT (i.e. defusion, acceptance, self as context, committed action, values, and

present moment). The authors only included studies testing single-session conditions targeting psychological flexibility components as compared to alternative conditions (e.g. distraction, attention control condition), to which participants were randomly assigned. They identified five cognitive defusion studies, all of which used the vocalisation technique of verbal repetition (De Young Lavender, Washington, Looby, & Anderson, 2010; Masuda, Hayes, Sackett, & Twohig 2004; Masuda, Feinstein, Wendell, & Sheehan, 2010; Masuda et al., 2010; Watson, Burley & Purdon, 2010). They compared cognitive defusion to inactive comparison conditions and calculated a medium effect size (Hedge's  $g = .74$ ), favouring cognitive defusion.

Mediational analysis provides one way of obtaining support for the components of theoretical models by examining whether changes in the outcomes of interventions are functionally related to changes in theoretical processes. An additional method for testing theoretical components is to evaluate the impact of theoretically-derived treatment components in laboratory-based experimental research. Such laboratory-based component studies provide a methodology, in which intervention and contextual factors can be carefully controlled and manipulated to test hypotheses in a way that would be difficult to achieve in treatment outcome research. For this reason, it was decided to conduct a review of experimental laboratory-based component studies of cognitive defusion.

The current systematic review focuses on the effects of deliteralisation-type cognitive defusion techniques on the two outcome variables of distress and believability. It was decided to focus on these two variables as an initial search of the literature revealed these to be the two most commonly measured outcomes. This is not surprising given their direct relevance to cognitive defusion.

## **2. Method**

### **2.1 Search Methodology**

A systematic literature search was conducted in June 2013 to identify relevant articles from the following electronic databases: Medline, Embase, Psycinfo, CINAHL, Web of Science, and the Cochrane library. Subject heading and keyword searches used the following terms:

Defusion OR Deliterali\*

Truncating was used for the term “deliteralisation” to ensure identification of relevant terms, where word endings may differ (e.g. plural, adjectives, spelling). Deliteralisation was included as a search term because cognitive defusion was initially called deliteralisation by Hayes & Strosahl (2004). Dr Steven Hayes, a founding member of ACT, was also contacted to enquire about any further relevant articles. Finally, the reference lists of articles included in the systematic review and the reviews mentioned above were hand-searched to identify other potentially relevant studies.

## **2.2 Inclusion and exclusion criteria**

### *Inclusion Criteria*

- Experimental laboratory-based component studies examining the effects of deliteralisation-type cognitive defusion techniques on distress and believability of negative psychological content
- Studies reported in English
- Studies in peer-reviewed publications

### *Exclusion criteria*

- Dissertations
- Papers reporting expert opinion
- Observational studies
- Studies including metaphorical and meditative-type techniques about letting thoughts come and go or taking a non-judgmental stance towards thoughts
- Mediation analyses of ACT interventions
- Studies that included cognitive defusion as a component of a larger ACT intervention
- Studies that did not include distress or believability as a dependent variable

## **2.3 Quality criteria**

Included studies were evaluated using a structured assessment tool of methodological quality (see Appendix 1.2). The tool was developed based on a variety of sources, namely:

- Scottish Intercollegiate Guidelines Network (SIGN) methodology checklist 2 for Controlled Trials (2012)
- Boutron et al.’s (2005) checklist for assessing the quality of Randomised Controlled Trials evaluating non-pharmacological treatments

- Clinical Trials Assessment Measure (CTAM; Tarrier & Wykes, 2004)
- Downs and Black Checklist (1998) - a checklist for the assessment of the methodological quality both of randomised and non-randomised studies of healthcare interventions

The reviewer decided to combine questions from these tools in order to achieve a comprehensive mix of methodology quality questions that were deemed to be relevant to the studies reviewed.

Methodological quality was assessed by the author and an independent rater trained in the evaluation of clinical research. Each rater assessed the quality of papers using a score of zero to three for each item of the scale.

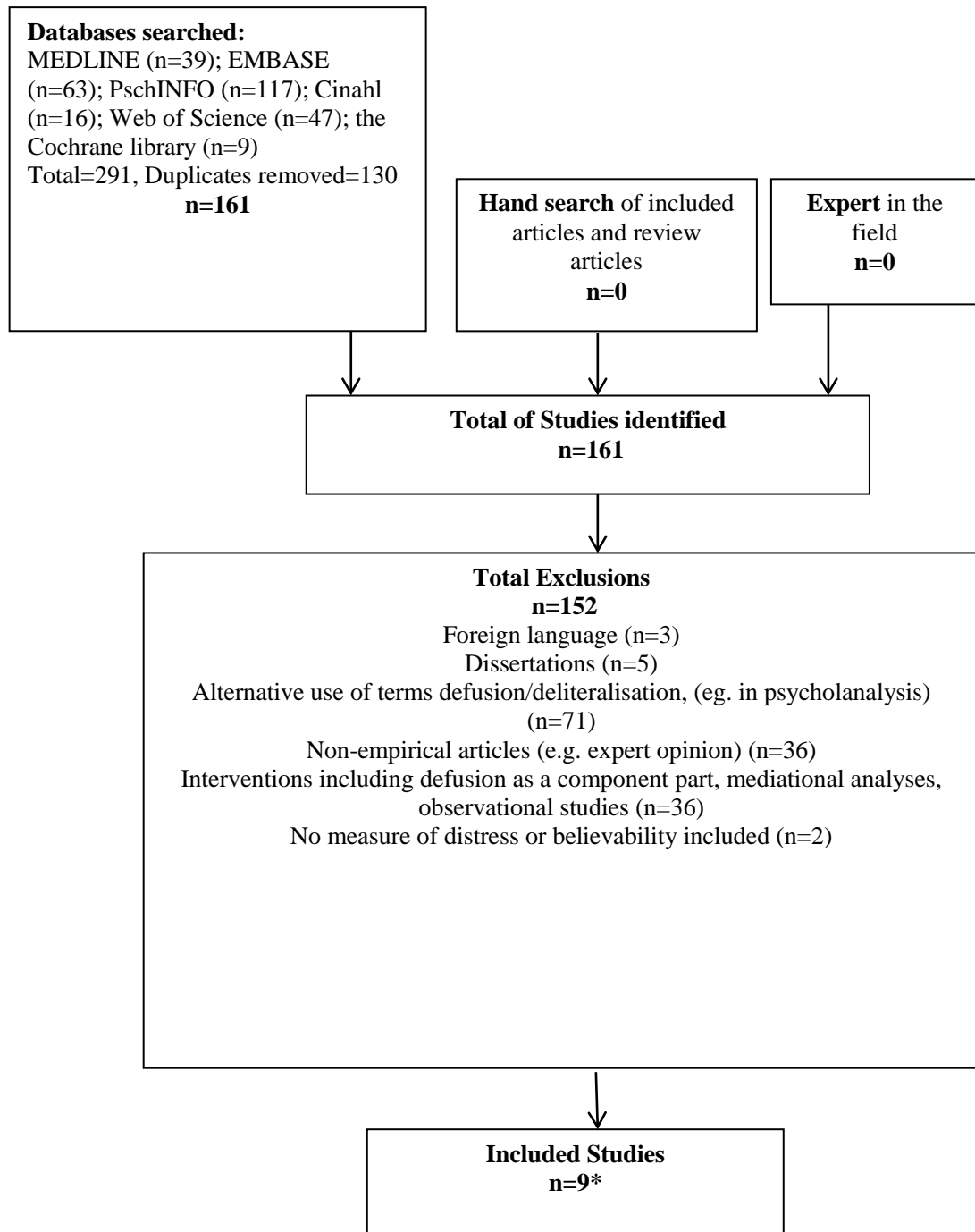
## **2.4 Guidelines for conducting and reporting the systematic review**

The reviewer was guided by the SIGN Methodology Checklist 1 for Systematic Reviews and Meta-analyses (2012). In addition, the PRISMA statement (Liberati et al., 2009) for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions informed the reporting of this systematic review.

# **3. Results**

## **3.1 Search Results**

A total of nine studies fulfilled criteria for inclusion in the review. The study selection process is illustrated below (Figure 1). It should be noted that the cognitive defusion instructions for one of the studies included in the review (i.e. Pilecki & McKay, 2012) made reference to another core therapeutic process of ACT, namely self as context. However, it was decided to retain this study in the review, as the reference to self as context appeared to have been added to enhance defusion and no metaphors or experiential exercises specific to self as context were included in the instructions.



\*It should be noted these studies included 14 analyses in total, as some of the papers included (i) more than one study, (ii) analyses of combined data from a number of studies, (iii) or analyses of subsamples.

**Fig. 1:** Flow diagram of study selection process

## **3.2 Characteristics of Included Studies**

### ***3.2.1 Samples***

The study samples are described in Table 1. Participants were all student volunteers. Their mean age was either late teenage years or early twenties. Females made up at least 60% of the sample in every study, with two of the studies consisting of only females. All of the studies were conducted in the United States of America or Canada, except for one Irish study (Healy et al., 2008). Two of the nine included studies consisted of clinical analogue samples (Deacon, Fawzy, Lickel, & Wolitzky-Taylor, 2011; Watson, Burley & Purdon, 2010). The remaining seven were non-clinical samples. However, two of these studies (Masuda, Feinstein, Wendell & Sheehan, 2010; Masuda et al., 2010) included sub-analyses of participants, who met a cut-off score of 10 on the Beck Depression Inventory-II. They were described as having “elevated depressive symptoms”. Less than a third (i.e. 29%) of the analyses included a power calculation or had a sample size greater than 27 in each treatment group, one of the quality criteria in the CTAM (Tarrier & Wykes, 2004).

**Table 1: Sample Description**

Author	Country	Recruitment	Sample size (N )	Average Age of Total Sample	Sex Distribution of Total Sample F:M
Deacon, Fawzy, Lickel, Wolitzky-Taylor (2011)	US	Clinical analogue sample of individuals with highly distressing thoughts regarding body shape. Psychology students completed Body Shape Questionnaire for course credit. If they scored > than the mean for a sample of women with eating disorders, they were invited to participate.	26	Mean=19.4 (SD=2.1)	26:0
De Young, Lavender, Washington, Looby, & Anderson (2010)	US	Non-clinical undergraduate students participated for credit toward a course requirement	200	Mean=19.3 (SD=3.6)	136:64
Healy et al. (2008)	Ireland	Undergraduate student volunteers recruited through faculty announcements in a psychology department	60	Mode=21 (Range=18-57)	31:29
Masuda, Hayes, Sackett, & Twohig (2004)	US	Undergraduate students recruited from psychology course subject pool	8	(Range =18-19)	8:0
Masuda et al. (2009) <u>Experiment 1</u>	US	Recruited from an undergraduate psychology students' subject pool	75	Mean=20.8	55:20
<u>Experiment 2</u>	US		94	Mean=20.2	67:27
Masuda, Feinstein, Wendell, & Sheehan (2010)	US	Non-clinical undergraduate psychology students recruited from web-based research participant pool (included subgroup with elevated depressive symptoms)	147	Mean=20.52 (SD=4.39)	115:32
Masuda et al. (2010)	US	Non-clinical psychology undergraduates recruited from web-based research participant pool (included subgroup with elevated depressive symptoms)	132	Mean=20.91 (SD=6.96)	102:30
Pilecki & McKay (2012)	US	Undergraduate students recruited from a University subject pool	67	Mean=19.29 (SD=1.02)	40:27
Watson, Burley, & Purdon (2010) <u>Study 1</u>	Canada	Psychology students high in contamination fears, score on contamination subscale of Padua Inventory-WSUR $\geq$ mean subscale score (14) of a clinical sample diagnosed with OCD	93	Mean=19.39 (SD=1.79)	82:11
<u>Study 2</u>	Canada		134	Mean=19.33 (SD=1.80)	88:46



### ***3.2.2 Study design***

As can be seen from Table 2 below, participants in two of the studies (Deacon, Fawzy, Lickel & Wolitzky-Taylor, 2011; Watson, Burley & Purdon, 2010) were instructed to practise the intervention, to which they were assigned, in their natural environment over a week. All of the studies used randomisation when assigning participants to groups. However, the process of randomisation was not explained in any of these studies. The majority of the nine studies (i.e. 7) employed verbal repetition as a cognitive defusion technique, whereas the remaining studies used the technique of noticing and labelling thoughts. Eight of the studies compared cognitive defusion to either a control condition or an active alternative treatment strategy. Masuda et al. (2009) compared various durations of verbal repetition and did not include any alternative treatment or control condition. Cognitive defusion was compared to the following active treatment strategies: cognitive restructuring (Deacon, Fawzy, Lickel & Wolitzky-Taylor, 2011); distraction (Masuda, Feinstein, Wendell & Sheehan, 2010; Masuda et al., 2010); thought suppression (Pilecki & McKay, 2012); imaginal exposure (Watson, Burley & Purdon, 2010); and an Implicit Associations Task (DeYoung, Lavender, Washington, Looby & Anderson, 2010). All of the studies used idiosyncratic self-report measures of distress and believability. The majority of these measures were one-item, except for one study (Watson, Burley & Purdon, 2010). One study also employed the Stroop test as an indirect measure of emotional arousal (Pilecki & McKay, 2012).

**Table 2:** Study Design Characteristics in relation to Distress and Believability

Author	Setting	Design/ Randomisation	Cognitive Defusion Technique (CD) Rationale/Instructions	Comparison/Control condition	Dependent variables
Deacon, Fawzy, Lickel, & Wolitzky- Taylor (2011)	Laboratory + Natural	Participants randomly assigned to 1 of 2 conditions	Verbal repetition (CD) (60 seconds) of negative body image thoughts reduced to a single word (e.g. fat). Rationale plus experiential exercise in laboratory and practice over the following week.	Cognitive restructuring (CR) of negative body image thoughts. Rationale plus experiential exercise in laboratory and practice over the following week. No control condition.	Ratings of thought of being fat conducted pre-rationale, post-rationale, and post- homework (a week later). Self-report 1-item measures of distress and accuracy
De Young, Lavender, Washington, Looby, & Anderson (2010)	Laboratory	Participants were randomised to 1 of 5 conditions	Verbal repetition (30 seconds) of negative self- referential words with (CD- R) or without a rationale (CD)	Implicit Associations Task with (IAT- R) or without rationale (IAT) and a Control Condition (C) (reading about hydrogen fuel cell technology)	Self-report 1-item measures of discomfort and believability
Healy et al. (2008)	Laboratory	Participants randomised to 1 of 3 groups (Pro-CD, i.e. told CD decreases emotional impact of negative self- statements; Anti-CD, i.e. told CD increases emotional impact; Neutral instructions, i.e. told CD has no impact on emotional reaction)	Labelling thoughts (CD). (Described in next column)	All participants presented with 10 negative and 10 positive self- statements in normal (e.g. I am a bad person), CD (e.g. I am having the thought that I am a bad person), and abnormal formats (e.g. I have a wooden chair and I am a bad person) (Results are not presented for positive statements as they are not the focus of this review)	Self-report 1-item measures of discomfort and believability

Masuda, Hayes, Sackett, & Twohig (2004)	Laboratory	<p>Experiment 1: 4 participants exposed to CD and distraction</p> <p>Experiment 2: Another 4 participants exposed to CD and thought control</p>	Clinical rationale and verbal repetition (30 seconds) of negative self-relevant thoughts restated in one word	<p>Experiment 1: Control condition- Distraction/no clinical rationale (i.e. reading about Japan).</p> <p>Experiment 2: Thought control tasks/rationale provided (e.g. positive self-talk, positive imagery, and breathing training). This was a control condition intended to control for demand characteristics.</p>	Self-report 1-item measures of discomfort and believability (taken pre- and post-intervention)
Masuda et al. (2009) <u>Exp. 1</u>	Laboratory	Participants randomly assigned to 1 of 3 conditions	Verbal repetition of negative self-relevant thought restated in one word. 3 conditions: 1. Rationale and training (with neutral word, i.e. milk) 2. Rationale, training, and 3-second repetition. 3. Rationale, training, and 20-second repetition.	No active comparison condition/No control condition	Self-report ratings of discomfort and believability
<u>Exp. 2</u>	Laboratory	Participants randomly assigned to 1 of 3 conditions	Verbal repetition of negative self-relevant thought restated in one word. 3 conditions – 1. Rationale, training, and 1-second repetition of word. 2. Rationale, training, and 10-second repetition. 3. Rationale, training, and 30-second repetition of word.	No active comparison condition/No control condition	
<u>Results of exp. 1 + 2 combined</u>		Violates randomisation	Conditions from previous 2 experiments were combined and data were reanalysed		

Masuda, Feinstein, Wendell, & Sheehan (2010)	Laboratory	Participants randomly assigned to 1 of 5 conditions	Verbal repetition. 2 conditions - rationale and training (verbal repetition of neutral word for 20 seconds) (Partial) (P-CD) or rationale, training with neutral word, and experiential exercise (30 seconds) with negative self-referential word (Full) (F-CD)	Thought distraction (active comparison), 2 conditions - rationale and training with neutral word (Partial) or rationale, training with neutral word, and experiential exercise with negative self-referential word (Full) Or distraction-based experimental control condition (e.g. reading about Stonehenge) to control for non-specific factors. No rationale, training, or experiential exercise.	Self-report 1-item measures of discomfort and believability (used pre- and post-intervention)
Masuda et al. (2010)	Laboratory	Participants randomly assigned to 1 of 3 conditions	30-second verbal repetition of negative self-referential thoughts restated in one word (rationale provided)	Thought distraction strategy (active condition)-asked to think of something emotionally neutral or less unpleasant (rationale provided). Distraction-based experimental control task (inactive control condition) - no rationale, reading an emotionally neutral article about Japan.	Self-report 1-item measures of discomfort and believability (pre- and post-intervention)
Pilecki & McKay (2012)	Laboratory	Randomly assigned to 1 of 3 conditions	Noticing and labelling thoughts as thoughts (rationale and practice session)	Thought suppression (rationale and practice session) and control condition-asked to employ a strategy of their choosing for managing unwanted thoughts (e.g. think of other things) (also included a practice session)	VAS ratings of emotional response to 3 video clips chosen to elicit fear, sadness, and disgust, i.e. asked to rate the degree to which clip caused participants to feel the following 6 emotions (sad, angry, amused, disgusted, fearful/anxious, content). Plus performance on a Stroop test following presentation of video clips (indirect measure of emotional arousal)

Watson, Burley, & Purdon (2010) <u>Study1</u>	Laboratory	Participants were randomised to 1 of 3 conditions. All participants completed a category membership decision task (CMDT) prior to interventions to test for semantic satiation in the CD condition (did not produce significant changes in negative response index <sup>a</sup> )	Verbal repetition (30 seconds) of contamination-related words following rationale	Brief (30 seconds) imaginal exposure (IE) to contamination-related thoughts (plus rationale) and a control condition (sitting quietly, no rationale)	Self-report negative response index <sup>a</sup> = average of distress, believability, and meaningfulness ratings. Baseline ratings (before CMDT), pre-intervention, post-intervention, and follow-up (one week later)
<u>Study 2</u>	Laboratory + Natural	Similar to study 1, except that participants asked to practice intervention strategy each day over one-week follow-up period			

### 3.3 Study Quality Results

Inter-rater reliability regarding study quality was assessed by calculating the frequency of agreements between raters for each score category (0-3) across all items and all studies. The agreement rate was 76%. Total agreement for all items was subsequently achieved through discussion between raters. A percentage quality rating was then calculated for each study (see Appendix 1.3). The following rule of thumb was applied to describe the quality of the studies: Good (> 75%); Moderate (50-75%); Poor (<50%). Table 3 provides details of these results.

**Table 3:** Methodological Quality Ratings of Included Studies

Author	Rating (0-100%)	Quality Category
Deacon, Fawzy, Lickel, & Wolitzky-Taylor (2011)	52	Moderate
De Young et al. (2010)	57	Moderate
Healy et al. (2008)	52	Moderate
Masuda, Hayes, Sackett, & Twohig (2004)	30	Low
Masuda et al. (2009) Exp. 1	50	Moderate
Exp. 2	50	Moderate
Exps 1 +2	50	Moderate
Masuda, Feinstein, Wendell, & Sheehan (2010)	64	Moderate
Subgroup	61	Moderate
Masuda et al. (2010)	76	Good
Subgroup	67	Moderate
Pilecki & McKay (2012)	64	Moderate
Watson, Burley, & Purdon (2010) Study 1	52	Moderate
Study 2	60	Moderate

### 3.4 Impact of Cognitive Defusion on Distress and Believability

The results of studies comparing cognitive defusion to alternative treatment conditions, to control conditions and finally the studies that did not include a comparison condition are described below. In addition, effect sizes for the studies are presented in Table 4.

**Table 4: Effect Sizes**

Author	Effectiveness of Cognitive Defusion (CD)
Deacon, Fawzy, Lickel, & Wolitzky-Taylor (2011)	<p><u>Within CD group</u>            Fat distress: Rationale phase, <math>d=0.87</math>; Homework phase, <math>d=-0.04</math>            Fat accuracy: Rationale phase, <math>d=1.20</math>; Homework phase, <math>d=-0.14</math>            (Positive values indicate change in the direction of improvement)  <u>Between groups</u>            Fat distress: Rationale phase, <math>d=0.32</math>; Homework phase, <math>d=-0.52</math>            Fat accuracy: Rationale phase, <math>d=0.75</math>; Homework phase, <math>d=-0.94</math>            (Positive values indicate greater improvement in CD condition, negative values indicate greater improvement in CR condition)</p>
De Young, Lavender, Washington, Looby, & Anderson (2010)	<p><u>Within-group (pre-post)</u>            CD-R: lower discomfort <math>d=0.61</math>; lower believability <math>d=0.95</math>            CD: lower discomfort <math>d=0.57</math>; lower believability <math>d=0.67</math>  <u>Between group using post-test results*</u>            CD-R vs. CD: discomfort <math>d=0.08</math>; believability <math>d=-0.20</math>            CD-R vs. IAT-R: discomfort <math>d=0.01</math>; believability <math>d=-0.40</math>            CD-R vs. IAT: discomfort <math>d=-0.06</math>; believability <math>d=-0.30</math>            CD-R vs. Control: discomfort <math>d=-0.16</math>; believability <math>d=-0.24</math>            (Positive values indicate higher discomfort and believability in CD-R condition)            CD vs. IAT-R: discomfort <math>d=-0.08</math>; believability <math>d=-0.15</math>            CD vs. IAT: discomfort <math>d=-0.15</math>; believability <math>d=-0.10</math>            CD vs. Control: discomfort <math>d=-0.25</math>; believability <math>d=-0.04</math>            (Positive values indicate higher discomfort and believability in CD condition)</p>
Healy et al. (2008)	<p><u>Within groups-Comfort ratings*</u>  <u>Pro-CD instructions</u>            CD vs. Normal: <math>d=-0.41</math>; CD vs. Abnormal: <math>d=-0.27</math>  <u>Anti-CD instructions</u>            CD vs. Normal: <math>d=-0.23</math>; CD vs. Abnormal: <math>d=-0.10</math>  <u>Neutral instructions</u>            CD vs. Normal: <math>d=-0.27</math>; CD vs. Abnormal: <math>d=-0.34</math>  <u>Within groups-Believability ratings*</u>  <u>Pro-CD instructions</u>            CD vs. Normal : <math>d=-1.34</math>; CD vs. Abnormal : <math>d=-1.17</math>  <u>Anti-CD instructions</u>            CD vs. Normal : <math>d=-0.31</math>; CD vs. Abnormal: <math>d=-0.30</math>  <u>Neutral instructions</u>            CD vs. Normal: <math>d=-0.85</math>; CD vs. Abnormal: <math>d=-0.66</math>  <u>Between groups-Comfort ratings for CD presentation format*</u>            Pro-CD vs. anti-CD instructions: <math>d=-0.66</math>; Pro-CD vs. Neutral instructions: <math>d=-0.46</math>  <u>Between groups-Believability ratings for CD presentation format*</u>            Pro-CD vs. anti-CD instructions: <math>d=0.02</math>; Pro-CD vs. Neutral instructions: <math>d=-0.95</math>            (Positive values indicate higher discomfort and lower believability in CD format and Pro-CD instruction group)</p>

Masuda, Hayes, Sackett, & Twohig (2004)	No effect size data available
Masuda et al. (2009)	No effect size data available
Masuda, Feinstein, Wendell, & Sheehan (2010)	<p><u>Within group</u>  P-CD: Discomfort, <math>d=0.91</math>; Believability, <math>d=0.95</math>  F-CD: Discomfort, <math>d=1.57</math>; Believability, <math>d=1.57</math> (all lower ratings post-intervention)</p> <p><u>Between group</u>  P-CD vs. F-CD: Discomfort, <math>d=0.93</math>; Believability, <math>d=0.85</math>  P-CD vs. P-Distracton: Discomfort, <math>d=-0.19</math>; Believability, <math>d=-0.25</math>  P-CD vs. F-Distracton: Discomfort, <math>d=-0.13</math>; Believability, <math>d=-0.12</math>  P-CD vs. Control: Discomfort, <math>d=-0.23</math>; Believability, <math>d=-0.30</math>  F-CD vs. P-Distracton: Discomfort, <math>d=-1.37</math>; Believability, <math>d=-1.40</math>  F-CD vs. F-Distracton: Discomfort, <math>d=-1.17</math>; Believability, <math>d=-1.18</math>  F-CD vs. Control: Discomfort, <math>d=-1.20</math>; Believability, <math>d=-1.28</math> (F-CD group had lower scores post-intervention than all other conditions)</p> <p><u>Subgroup with elevated depressive symptoms (n=71) <sup>+</sup></u>  <u>Within group</u>  P-CD: Discomfort, <math>d=0.93</math>; Believability, <math>d=1.25</math>  F-CD: Discomfort, <math>d=1.61</math>; Believability, <math>d=1.32</math> (All ratings lower post-intervention)</p> <p><u>Between group</u>  P-CD vs. F-CD: Discomfort, <math>d=1.21</math>; Believability, <math>d=0.67</math>  P-CD vs. P-Distracton: Discomfort, <math>d=-0.00</math>; Believability, <math>d=-0.44</math>  P-CD vs. F-Distracton: Discomfort, <math>d=-0.03</math>; Believability, <math>d=-0.25</math>  P-CD vs. Control: Discomfort, <math>d=-0.33</math>; Believability, <math>d=-0.51</math>  F-CD vs. P-Distracton: Discomfort, <math>d=-1.56</math>; Believability, <math>d=-1.53</math>  F-CD vs. F-Distracton: Discomfort, <math>d=-1.35</math>; Believability, <math>d=-1.13</math>  F-CD vs. Control: Discomfort, <math>d=-1.78</math>; Believability, <math>d=-1.58</math> (F-CD group had lower scores post-intervention than all other conditions)</p>
Masuda, et al. (2010)	<p><u>Within group (CD):</u> discomfort, <math>d=1.70</math>; believability, <math>d=1.60</math> (Both lower post-intervention)</p> <p><u>Between group</u> CD vs. distraction: discomfort, <math>d=-0.54</math>; believability, <math>d=-0.74</math>  CD vs. control: discomfort, <math>d=-1.13</math>; believability, <math>d=-1.20</math> (CD group reported lower discomfort and believability than distraction and control groups post-intervention)</p> <p><u>Subgroup with elevated depressive symptoms (n=42) <sup>+</sup></u>  <u>Within group (CD):</u> discomfort, <math>d=1.90</math>; believability, <math>d=1.30</math> (Both outcomes lower post-intervention)</p> <p><u>Between group</u> CD vs. distraction: discomfort, <math>d=-0.30</math>; believability, <math>d=-0.65</math>  CD vs. control: discomfort, <math>d=-0.93</math>; believability, <math>d=-0.99</math> (CD group ratings lower than distraction and control groups post-intervention)</p>
Pilecki & McKay (2012)	<p><u>VAS between groups Effect Sizes*</u>  Disgust ratings for the disgust clip  CD vs. Suppression (<math>d=0.65</math>); CD vs. Control (<math>d=0.36</math>)  Sadness ratings for the sadness clip  CD vs. Suppression (<math>d=0.43</math>); CD vs. Control (<math>d=0.15</math>)  Anxiety ratings for the anxiety clip  CD vs. Suppression (<math>d=0.28</math>); CD vs. Control (<math>d=-0.24</math>)  Positive scores indicate higher degree of the target emotion in the CD condition</p>



Watson, Burley, & Purdon (2010)	<u>Within group*</u> CD: Pre- vs. Post-intervention, $d=0.74$ ; Baseline vs. Follow-up, $d=0.34$ (decrease in negative response index)
<u>Study 1</u>	
<u>Study 2</u>	<u>Within group*</u> CD: Pre- vs. Post-intervention, $d=0.73$ ; Baseline vs. Follow-up, $d=0.78$ ; Post-intervention vs. Follow-up, $d=0.11$ (decrease in negative response index) <u>Between groups*</u> Post-intervention, CD vs. IE ( $d=-0.70$ ); CD vs. Control ( $d=-0.65$ ) Follow-up, CD vs. IE ( $d=-0.52$ ); CD vs. Control ( $d=-0.88$ ) (CD had lower ratings than other 2 groups)

\*Effect sizes calculated by reviewer using Cohen's  $d$ ,  $ES (d) = \frac{\text{mean 1} - \text{mean 2}}{\text{pooled standard deviation}}$

\*Selected using a cut-off score of 10 on the Beck Depression Inventory-II, based on the mean score for the entire sample

### 3.4.1 Cognitive Defusion versus Alternative Treatment Conditions

A number of studies compared cognitive defusion to alternative treatment strategies. Deacon, Fawzy, Lickel, and Wolitzky-Taylor (2011) compared cognitive defusion to cognitive restructuring. They found that both strategies produced significant decreases in discomfort and believability over time (assessed at pre-rationale, post-rationale, and post-homework). Effect sizes within the cognitive defusion group were large for both distress and believability from pre- to post-rationale, but they revealed little change in either of these dependent variables between post-rationale and post-homework. This study did not include a control condition.

Two studies compared cognitive defusion to distraction (Masuda, Feinstein, Wendell & Sheehan, 2010; Masuda et al., 2010). Masuda, Feinstein, Wendell, and Sheehan (2010) found that discomfort and believability were significantly lower post-intervention for cognitive defusion, distraction, and a control condition ( $p<.05$ ). This study included two cognitive defusion conditions, namely Full and Partial CD. Details of these conditions are provided in Table 2. Pairwise comparisons revealed that the Full CD group had significantly lower discomfort and believability than the other groups in the study ( $p<.01$ ). Similar results were found with a sub-group of participants in this study with "elevated depressive symptoms". Finally, when the two cognitive defusion conditions were compared, medium to large effect sizes were found in both the larger group and those with elevated depressive symptoms. All of these effect sizes were in favour of the Full CD condition.

Masuda et al. (2010) also compared cognitive defusion, distraction, and a control condition. They found that discomfort at post-intervention was significantly lower across all conditions ( $p < .001$ ). However, the cognitive defusion group reported significantly lower discomfort than the other groups ( $p < .05$ ). The results for believability were almost identical. This study also included a sub-analysis of participants with “elevated depressive symptoms”. Discomfort results revealed a main effect for condition ( $p < .05$ ). Pairwise comparisons showed that the cognitive defusion group had significantly lower discomfort than the control condition ( $p < .01$ ) but not the distraction condition. As regards believability, a main effect for time was revealed ( $p < .001$ ). Pairwise comparisons revealed a significant reduction of believability ( $p < .001$ ). In addition, a large effect size was found at post-intervention when comparing believability scores for cognitive defusion and control conditions and a medium effect size was found when comparing cognitive defusion and distraction. These results favoured the cognitive defusion condition.

Pilecki and McKay (2012) compared cognitive defusion to thought suppression and a control condition. They found no significant difference in self-report ratings of emotional response between the three conditions ( $p = .45$ ). They also employed the Stroop test as an indirect measure of emotional arousal. This test indicated that the cognitive defusion group were less emotionally aroused than the control condition ( $p = .01$ ) but there was no significant difference between the cognitive defusion and suppression groups ( $p = .40$ ).

Watson, Burley and Purdon (2010) compared cognitive defusion with imaginal exposure to contamination-related words. They also included a control condition. They found that there were both significant immediate ( $p < .001$ ) and long-term decreases (over a week) ( $p < .01$ ) in negative response in the cognitive defusion group. The change in ratings pre- to post-intervention was greater for the cognitive defusion than the imaginal exposure group ( $p < .001$ ) but the change in ratings from baseline to follow-up (one week later) was equivalent for the two groups ( $p = .27$ ). The cognitive defusion group showed a significantly greater decrease in negative response than the control group at both pre- to post-intervention ( $p = .001$ ) and baseline to follow-up ( $p < .05$ ). Watson, Burley and Purdon (2010) also conducted a second study, similar to the above. However, this study differed in that participants were requested to practise their intervention strategy over the week-long follow-up period. There were both significant immediate ( $p < .001$ ) and long-term decreases

( $p < .001$ ) in negative response in the cognitive defusion group. At post-intervention, the cognitive defusion group had significantly lower ratings than the imaginal exposure and control groups ( $ps < .01$ ). Similar significant results were found at follow-up ( $ps < .001$ ).

Finally, DeYoung, Lavender, Washington, Looby, and Anderson (2010) compared cognitive defusion to an Implicit Associations Task (IAT) and a control condition. This study consisted of five conditions, two cognitive defusion conditions, either with or without a theoretically consistent rationale. Similarly, the IAT task was presented either with or without a rationale. Firstly, cognitive defusion and IAT tasks were compared. A significant main effect for time was found in discomfort ratings, such that post-test ratings were lower than pre-test ratings ( $p < .05$ ). Pairwise comparison indicated that both cognitive defusion and IAT resulted in significantly lower post-test discomfort ( $ps < .05$ ). There was also a significant time by task interaction ( $p < .05$ ). Participants performing the cognitive defusion task demonstrated a larger decrease in discomfort ratings than those performing the IAT task. No main effect for rationale ( $p = .90$ ) and no time by rationale ( $p = .83$ ) or task by rationale ( $p = .39$ ) interactions were found. As regards believability, there was again a main effect for time. Both cognitive defusion and IAT resulted in significantly lower post-test believability ( $ps < .05$ ). No other significant main or interaction effects were detected for task or rationale. Secondly, the authors conducted an analysis to compare the active treatment conditions to the control condition. None of the changes from pre-to post-test in any of the four active treatment groups exceeded the magnitude of regression to the mean observed in the control group (all  $ps > .003$ , statistical significance level following Bonferroni correction).

### ***3.4.2 Comparison solely to Control Conditions***

Masuda, Hayes, Sackett, and Twohig (2004) conducted two experiments, where they compared cognitive defusion to a control condition. One of the control conditions was a simple distraction task without a rationale, whereas the other control condition attempted to control for demand characteristics by providing a rationale for a thought control task. Both experiments had repeated measures designs. Cognitive defusion reduced discomfort and believability more than the control conditions in both experiments. However, no inferential statistics were reported.

Participants in Healy et al. (2008) were randomised to one of three conditions, receiving pro- or anti-defusion or neutral instructions (between-group factor). All participants were presented with statements in a defused, normal, and abnormal format (within-group factor). For discomfort, there was no main effect for instruction group ( $p=.21$ ) or instruction group by presentation format interaction effect ( $p=.17$ ). There was a significant main effect for presentation format ( $p<.0001$ ). Cognitive defusion significantly decreased discomfort relative to the normal ( $p<.0001$ ) and abnormal ( $p=.0001$ ) formats. For believability, there was no main effect for instruction group ( $p=.12$ ). There was a significant effect for presentation format ( $p<.0001$ ) and a significant interaction effect ( $p=.003$ ). Post-hoc tests revealed that believability was greater for cognitive defusion relative to both normal and abnormal presentation formats in all three instruction groups ( $ps<.05$ ).

#### ***3.4.3 No alternative Comparison Condition***

Masuda et al. (2009) compared various durations of verbal repetition (cognitive defusion) but did not include any alternative treatment or control condition. Firstly, they assigned participants to one of three conditions: (i) defusion rationale only; (ii) rationale and 3 seconds of verbal repetition; (iii) rationale and 20 seconds of verbal repetition. Results revealed that the rationale condition reduced discomfort significantly less than both the 3-second ( $p<.001$ ) and the 20-second ( $p<.001$ ) verbal repetition conditions. However, the latter two conditions did not differ ( $p=.99$ ). The rationale only condition reduced believability significantly less than both the 3-second ( $p<.001$ ) and the 20-second conditions ( $p<.001$ ). Furthermore, the believability of the 20-second condition was significantly less than the 3-second condition ( $p=.002$ ). Masuda et al (2009) conducted a second experiment with identical conditions to the first experiment, except that the duration of repetition was 1 second, 10 seconds, or 30 seconds. The 1-second condition reduced discomfort significantly less than the 10-second ( $p<.02$ ) and 30-second conditions ( $p<.001$ ), whereas the latter two conditions did not differ significantly ( $p=.07$ ). The 1-second condition also reduced believability significantly less than the 10-second ( $p<.02$ ) and 30-second ( $p=.004$ ) conditions. However, the believability of the latter two conditions did not differ ( $p>.25$ ). Finally, the authors combined those groups from experiments 1 and 2 that were not significantly different and reanalysed the data. The rationale/1-second combination reduced discomfort significantly less than both the 3-second/10-second combination ( $p<.001$ ) and the 20-second/30-second combination ( $p<.001$ ). The difference

between the latter two combinations was not significant ( $p=.14$ ). The rationale/1-second combined group reduced believability significantly less than both the 3-second/10-second ( $p<.001$ ) and the 20-second/30-second combinations ( $p<.001$ ). The difference between the latter two combinations was also significant ( $p=.006$ , greater reduction for 20-second/30-second combination).

## **4. Discussion**

### **4.1 Included studies**

As mentioned previously, the Levin, Hildebrandt, Lillis, and Hayes (2012) meta-analysis calculated a medium effect size in favour of cognitive defusion when comparing it to inactive conditions. All of the included studies employed the deliteralisation technique of verbal repetition. This systematic review includes all of the studies on cognitive defusion identified in this meta-analysis plus an additional four studies. Since the Levin, Hildebrandt, Lillis, and Hayes (2012) meta-analysis was conducted (included studies up to February 2011), two additional studies using deliteralisation-type cognitive defusion have been published (Deacon, Fawzy, Lickel, & Wolitzky-Taylor, 2011; Pilecki & McKay, 2012). One of these studies used the verbal repetition technique again. The other study used an alternative technique, namely labelling thoughts as thoughts by adding the prefix “There I go with a thought that...”. Furthermore, two studies that did not meet the inclusion criteria of Levin, Hildebrandt, Lillis, and Hayes (2012) were included in this systematic review. One study provided an experimental test of the cognitive defusion exercise of adding the prefix “I am having the thought that...” for coping with negative and positive self-statements (Healy et al., 2008). It did not meet the inclusion criteria for the above meta-analysis because it did not use a randomised between-groups design (all participants were exposed to defusion, normal, and abnormal conditions). Secondly, Masuda et al. (2009) manipulated durations of verbal repetition. It did not meet the inclusion criteria of Levin, Hildebrandt, Lillis, and Hayes (2012) because it did not include any alternative conditions to cognitive defusion. Therefore, this systematic review updates the evidence base regarding laboratory-based component studies of cognitive defusion, specifically in relation to deliteralisation-type techniques.

## 4.2 Impact of Cognitive Defusion on Distress and Believability

All but one of the studies in this review examined the effects of cognitive defusion on distress and believability compared to alternative treatment and/or control conditions. Cognitive defusion was generally found to have equivalent results to cognitive restructuring and thought suppression and superior results to distraction, imaginal exposure therapy, and control conditions. Interestingly, one of these studies, Deacon, Fawzy, Lickel, and Wolitzky-Taylor (2011) found that cognitive defusion and cognitive restructuring produced substantial and comparable improvements. One of the limitations of this study was that it did not include a control group. Accordingly, these findings may be accounted for by placebo effects, social desirability, or regression to the mean. However, given that cognitive restructuring is a central component of “the most clearly established effective psychotherapy that exists” (Leahy, 2008, p.149), it is promising that cognitive defusion produced similar results. As referred to above, Watson, Burley and Purdon (2010) reported that cognitive defusion was superior to imaginal exposure in reducing negative responses to contamination-related words. Imaginal exposure is a component of Exposure and Response Prevention therapy, a treatment for obsessive compulsive disorder (OCD) that has been found to be at least as effective as pharmacological approaches (Foa & Kozak, 1996). However, it should be pointed out that the imaginal exposure intervention consisted of 30 seconds of imaginal exposure to thoughts about contamination-related words. It is likely that this exposure did not have optimal effect, as it is repeated exposures to an imagined scenario that leads to a reduction in associated distress (Gillihan, Williams, Malcoun, Yadin, & Foa, 2012). Furthermore, participants did not receive any instruction in how to conduct imaginal exposure. It is possible that some participants were poor at using imagery and would have required training in order to benefit fully from imaginal exposure. Therefore, the finding in relation to imaginal exposure appears to be more equivocal than what is claimed by the study authors.

There were some exceptions to the positive findings for cognitive defusion. For example, Healy et al. (2008) compared cognitive defusion to two control conditions. All participants in this study were presented with negative self-statements in a normal format (e.g. I am a bad person), an abnormal format (e.g. I have a wooden chair and I am a bad person), and a defused format (e.g. I am having the thought that I am a bad person). Unexpectedly, believability was *higher* for the cognitive defusion format relative to the other two formats.

However, it was suggested that the believability measure used was problematic. The authors proposed that it was likely that participants were responding to the whole defusion statement (e.g. how believable is it that you are having the thought that you are a bad person?). If this were the case, the increased believability ratings for the defused statements would have indicated that the participants believed they were having the thought rather than indicating that the thought was true. For this reason, the effects of cognitive defusion on believability remained unclear. Furthermore, DeYoung, Lavender, Washington, Looby, and Anderson (2010) reported a null finding for cognitive defusion. In their study, the cognitive defusion technique of verbal repetition was compared to IAT and a control condition. IAT requires that words retain literal meaning in contrast to verbal repetition, where a word is repeated aloud quickly until the context required for the word to have literal meaning changes. The results indicated that neither cognitive defusion nor IAT demonstrated changes beyond what could be accounted for by statistical regression. Furthermore, the failure to demonstrate such change was not due to lack of statistical power. The authors pointed out that they did not assess the credibility of the rationales provided for each technique and therefore it was unclear if lack of rationale credibility was responsible for their finding. However, the cognitive defusion rationale resembled the script from the Hayes, Strosahl and Wilson (1999) “milk” example. This is similar to the other studies of verbal repetition in this review that reported positive findings for cognitive defusion (i.e. Deacon, Fawzy, Lickel, & Wolitzky-Taylor, 2011; Masuda, Hayes, Sackett, & Twohig, 2004; Masuda et al. 2010, Masuda, Feinstein, Wendell, & Sheehan, 2010; Watson, Burley & Purdon, 2010). Therefore, it is unclear why the rationale would have lacked credibility.

The studies reviewed also reported a number of additional findings about potential moderator variables, namely experiential exercises, practice, and duration of verbal repetition. Masuda, Feinstein, Wendell, and Sheehan (2010) compared two cognitive defusion conditions. One comprised a rationale and training (i.e. verbal repetition with a neutral word, i.e. “milk”), the other comprised the same procedure plus an experiential exercise of verbal repetition of a target negative self-referential word (e.g. “idiot”). They found that the latter technique resulted in lower discomfort and believability of the target negative thought. This finding is consistent with the emphasis in ACT on the use of experiential exercises (Harris, 2009).

Two of the studies included follow-up periods, when participants were asked to practise cognitive defusion. Deacon, Fawzy, Lickel, and Wolitzky-Taylor (2011) included a follow-up period of one week, during which participants were asked to practise their assigned intervention. Effect sizes within the cognitive defusion group were large for both distress and believability immediately post-intervention. However, effect sizes revealed that there was little change in these outcome variables over the follow-up period. Watson, Burley and Purdon (2010) also included a one-week follow-up period, when participants were requested to practise cognitive defusion with contamination-related thoughts. The effect size for this follow-up period again indicated little change in negative response to these thoughts. These results suggest that practice of cognitive defusion over a longer time period might not improve outcomes.

Finally, Masuda et al. (2009) found that both discomfort and believability of negative thoughts varied systematically with the duration of word repetition. Emotional discomfort went down relatively quickly and repetition in the 3- to 10-second range was effective. Meanwhile, the reduction of believability took longer, reaching its maximum in the 20- to 30-second range.

#### **4.3 Limitations**

One of the limitations of the review relates to its focus on cognitive defusion techniques that try to reduce the literal quality of thoughts and the exclusion of techniques targeted at letting thoughts come and go and being non-judgmental regarding thoughts. As pointed out by Forman et al. (2012), cognitive defusion is linked with a perspective of non-judgmental acceptance toward experience in the ACT model. However, as mentioned previously, it was decided to exclude studies taking this perspective because of the overlap with acceptance and mindfulness techniques. Therefore, the findings reported in this review do not generalise to all of the various ways in which cognitive defusion can be conceptualised within ACT. Furthermore, it is possible that cognitive defusion examined in these studies was less effective when delivered in isolation from the broader therapeutic context in which it is typically implemented. On the other hand, studying therapeutic techniques in isolation avoids the ambiguities inherent in evaluating large treatment packages composed



of different procedures, some of which may be unhelpful (Hayes, Luoma, Bond, Masuda, & Lillis, 2006).

Another limitation of this review relates to the way it focused specifically on the effects of cognitive defusion on distress and believability. It excluded studies that did not include either of these measures. Studies by Hooper and McHugh (2013) and Hooper, Sandoz, Ashton, Clark, and McHugh (2012) both met this exclusion criterion. These studies examined the effects of cognitive defusion as a coping technique for food cravings and for unwanted thoughts during a learned helplessness preparation. The outcomes measures used were amount of chocolate eaten during a chocolate abstinence period and completion time on a maze task following the learned helplessness preparation. Furthermore, there were outcome measures additional to distress and believability in the included studies (e.g. willingness). However, as mentioned previously, none of the other outcomes measures were used as frequently as distress or believability.

Due to practical issues related to accessing unpublished materials, only studies from peer-reviewed publications were included in this review. Empirical research consistently suggests that published work is more likely to be statistically significant than unpublished research (Dickersin & Min, 1993), which leads to an overestimation of treatment effects. Therefore, this inclusion criterion introduced a potential publication bias in the findings. However, it ensured that the studies included met the quality standards required for peer-review publication. In addition, only publications in English were considered in this review. This also had the potential to introduce bias, as relevant non-English studies might have been excluded.

One of the limitations of the studies included in the review relates to their generalisability to clinical populations. All the studies were conducted with a young student population. It is likely that the student participants differed on a number of sociodemographic variables from clinical populations, such as age, social class, and education level. Furthermore, samples were at best analogue studies (i.e. Deacon, Fawzy, Lickel, & Wolitzky-Taylor, 2011; Watson, Burley & Purdon, 2010) for clinical populations. The majority of studies consisted of non-clinical samples. Two of these studies (Masuda, Feinstein, Wendell, &

Sheehan, 2010; Masuda et al., 2010) included sub-analyses of participants, who met a cut-off score of 10 on the Beck Depression Inventory-II (BDI-II). These participants were described as having “elevated depressive symptoms”. However, a score of 10 on the BDI-II is still within the “minimal depression” range. Therefore, it is possible that some of this subgroup did not even experience a mild level of depressive symptoms. However, there is evidence to suggest that convenience samples such as those employed in the studies in this review can provide valuable information that is relevant to clinical populations. Levin, Hildebrandt, Lillis, and Hayes (2012) commented that given the frequent use of convenience samples, a potential concern with laboratory-based component studies was that the findings might not apply to distressed or at-risk samples. Consequently, they tested for statistically significant differences between the effect sizes for distressed or at-risk samples (consisting of individuals with current or past psychological disorders, elevated symptoms, or important risk factors) versus convenience samples (university students, members of the community in general). The findings suggested that laboratory-based studies evaluating ACT components produced similar results with at-risk/distressed and convenience samples.

Another limitation of the included studies is that they all employed self-report, idiosyncratic measures. It is impossible to comment on the psychometric properties of idiosyncratic measures, namely reliability and validity. Indeed, Healy et al. (2008) proposed that their unexpected finding regarding *increased* believability for defused statements might have been the result of an invalid measure of believability. Furthermore, the use of self-report measures can introduce biases, such as social desirability and demand characteristics. Pilecki and McKay (2012) was the only study that included a measure that was not self-report. They employed the Stroop test as an indirect measure of emotional arousal. This test is able to detect subtle differences in attention and concentration, processes shown to be susceptible to interference during emotional arousal (MacLeod, 1991). The authors highlighted that this task had the advantage of being devoid of experimenter expectancies. As mentioned previously, the cognitive defusion group were found to be less emotionally aroused than the control group on the Stroop test.

#### 4.4 Conclusions

In conclusion, the studies reviewed provide positive findings in the main regarding the effects of cognitive defusion on distress and believability. One study (Healy et al., 2008) found that a cognitive defusion technique *increased* believability of negative thoughts. However, it seems likely that this finding was an artefact of the way in which believability was measured. Another study did, however, find that cognitive defusion was no better than a control condition (De Young, Lavender, Washington, Looby, & Anderson, 2010). Otherwise, cognitive defusion has been shown to produce superior results to distraction (Masuda, Feinstein, Wendell, & Sheehan, 2010; Masuda et al., 2010) and imaginal exposure (Watson, Burley & Purdon, 2010) and similar results to other active treatment conditions, namely cognitive restructuring (Deacon, Fawzy, Lickel, & Wolitzky-Taylor, 2011) and suppression (Pilecki & McKay, 2012). Other findings in this literature highlighted that practice over time does not necessarily improve the effectiveness of cognitive defusion (Deacon, Fawzy, Lickel, & Wolitzky-Taylor, 2011; Watson, Burley & Purdon, 2010). Experiential exercise with cognitive defusion techniques appears to be important (Masuda, Feinstein, Wendell, & Sheehan, 2010). Finally, one of the studies (De Young, Lavender, Washington, Looby, & Anderson, 2010) examined the effect of providing a rationale for the cognitive defusion technique of verbal repetition. This did not improve performance of the technique. Masuda et al. (2009) differed from the other studies in that it did not include a comparison condition. They found that the optimal duration of verbal repetition was 3-10 seconds to reduce discomfort and 20-30 seconds to reduce believability. Given the promising findings in relation to cognitive defusion described in this review and the dearth of research in the area, it would seem that further research into this therapeutic technique is warranted.

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## CHAPTER 2: MAJOR RESEARCH PROJECT

### **Comparing the Effectiveness of Thought Suppression and Cognitive Defusion in Managing Obsessional Intrusive Thoughts**

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## **Plain Language Summary**

### **Aims of Study**

The aim of this study was to find out what happens when people are asked to “suppress” or “defuse” from their unpleasant thoughts. Suppressing thoughts means asking people not to think about something. Some research has shown that this can paradoxically cause an increase in the frequency of thoughts. Defusion involves seeing thoughts as nothing more or less than words that are made up of sounds, and thinking about how helpful thoughts are rather than how true they are. It tries to create some distance between people and their thoughts so that their behaviour is not overly-influenced by thought content. Presently, there is relatively limited research looking at defusion. This study is interested in a particular type of thought experienced in Obsessive Compulsive Disorder (OCD), called an obsession. This is an unpleasant and unwanted thought that pops into people’s minds unexpectedly. One example would be “I left the cooker switched on”.

### **What the Study Involved**

Students at the University of Glasgow, who were frequently experiencing this type of intrusive thought, were asked to participate. They were randomly split into two groups: (1) suppression and (2) defusion. They were asked to record how many times they had intrusive thoughts over a six-day period. They also provided ratings about their distress levels and their views of these thoughts. On the middle two days of the experiment (days three and four), participants in the suppression group were asked to try as hard as possible not to think about their intrusive thought. Those in the defusion group were taught a simple defusion strategy. Whenever they had their intrusive thought, they were asked to repeat it silently in their head with this phrase in front of it, “I notice I am having the thought that ...”.

### **Results**

Both groups reported fewer intrusive thoughts in the two days after suppression and defusion (days 5 and 6) and there was no change in distress or believability of the intrusive thoughts over the six days. In addition, both groups generally had more favourable views of their unwanted intrusive thoughts after the experiment.

## **Conclusions**

The findings for the suppression group go against psychological theories of OCD, which say that thought suppression causes more intrusive thoughts to occur. It appeared that people in this study were using helpful ways to control their thoughts when they were asked to suppress them over the two days. In addition, the promising findings for the group that used defusion suggest that it may be worthwhile conducting more research in this area. Overall, the findings of this study may help to improve theories of OCD and treatments for intrusive obsessional thoughts.

## **Abstract**

**Background:** Thought suppression has been implicated in the development and maintenance of Obsessive Compulsive Disorder (OCD). Based on Wegner, Schneider, Carter, and White's (1987) research, suppression is widely viewed to lead to a paradoxical increase in thought frequency. However, further research evidence has been inconsistent and its interpretation has been hindered by methodological limitations of studies. Cognitive defusion offers a possible alternative method of managing intrusive thoughts. Although cognitive defusion strategies are frequently used within an Acceptance and Commitment Therapy (ACT) based clinical context, the empirical evidence to support their efficacy is relatively limited.

**Aims:** To employ a naturalistic experimental design to compare the effects of suppression and a cognitive defusion technique on thought frequency and distress in a non-clinical, highly obsessional cohort.

**Methods:** A cohort of 49 participants, screened for obsessional intrusions, completed a 6-day experiment. They were randomly allocated to a suppression (n=24) or cognitive defusion (n=25) group. The experiment involved three phases, each lasting two days: (1) baseline monitoring of intrusive thought occurrences; (2) experimental instruction (suppression or cognitive defusion); and (3) a return to simply monitoring thought occurrences.

**Results:** This study demonstrated that thought suppression did not lead to a paradoxical increase in thought frequency. Furthermore, there was a reduction in thought frequency in Phase 3 of the study for both groups and participants also generally had more favourable appraisals of their intrusive thoughts following the experiment.

**Conclusions:** The findings for thought suppression have implications for the refinement of thought control strategies used during suppression and the theoretical models and treatments of OCD that highlight the harmful effects of suppression. In addition, the promising findings for cognitive defusion suggest that further research in this area is warranted.

**Keywords:** Thought Suppression; Obsessive Compulsive Disorder; Cognitive Defusion

## **1. Introduction**

### **1.1 Background**

Unwanted intrusive thoughts emerge as symptoms across a range of disorders, from OCD to generalised anxiety disorder and depression (Clark, 2005). The focus in this study was on intrusive thoughts in OCD. Leading cognitive behavioural therapy (CBT) models of OCD implicate suppression (i.e. trying not to think about something) as key in the development and maintenance of this disorder. For example, Salkovskis argues that thoughts give rise to active resistance when they activate overvalued beliefs that thoughts can cause harm, and that the individual is bound to prevent harm, even if his/her responsibility for harm is minute and uncertain (Salkovskis, 1985, 1989, 1998; Salkovskis, Richards, & Forrester, 1995; Salkovskis et al., 2000). Thus, individuals must control thoughts that signify potential harm in order to prevent harm and the aversive sense that they may otherwise become responsible for harm. Furthermore, Rachman proposes that active resistance arises from beliefs that a thought about an immoral action is equivalent to performing that action (moral thought-action fusion) and that having thoughts about an event increases the likelihood of that event happening (likelihood thought-action fusion) (Rachman, 1997, 1998; Rachman & Hodgson, 1980). The individual attempts to control the thought because it offends her/his moral sensibilities both by its occurrence and because it may increase the likelihood of morally objectionable events occurring.

However, suppression is commonly believed to lead to a paradoxical increase in thought frequency since Wegner, Schneider, Carter, and White's (1987) classic "white bear" studies. In these studies, participants were randomly assigned to one of two groups, each completing two five-minute conditions in counterbalanced order: 1) trying not to think of a white bear (suppression); 2) trying to think of a white bear (expression). It was found that during suppression, participants were unable to suppress white bear thoughts fully. Furthermore, thought occurrences were more frequent in the expression period following initial suppression than in the initial expression period. Therefore, it was suggested that suppression produced what has been called the "rebound effect". Further research demonstrated an increase in thought frequency during the act of suppression (e.g. Lavy & van den Hout, 1990), known as the "immediate enhancement effect".

Research evidence in this area has, however, been inconsistent. The author of a systematic review of the effects of thought suppression on OCD (McLean, 2006) concluded that there

was no firm experimental evidence that suppression of OCD-type intrusions led to a rebound effect and that there was limited support for an immediate enhancement effect. Furthermore, the interpretation of findings in this area has been hampered by methodological limitations of some of the published studies. Key limitations identified in reviews by Purdon (2004), McLean (2006), and Abramowitz, Tolin, and Street (2001) include a lack of studies in clinical populations, studies that have used emotionally neutral thoughts, a reliance on lab-based experimental sessions, and lack of appropriate control conditions. Ralston (2011) addressed some of these limitations in a study that examined the impact of thought suppression on intrusive thought frequency and distress in a non-clinical, highly obsessional cohort. This study involved participants monitoring personally-relevant intrusive thoughts in their natural environments and included a control condition. Participants were randomly split into two groups: a) suppression and b) monitor only. For each day, over the course of the week, participants kept a record of how often they experienced their intrusive thoughts and provided ratings of associated anxiety. On days three and four, the suppression group were asked to try as hard as possible not to think about their personally-relevant intrusive thought. The suppression group reported fewer intrusive thoughts during and after suppression and less anxiety compared to the monitor only group. Accordingly, this study failed to provide support for immediate enhancement or rebound effects of thought suppression.

Cognitive defusion offers a possible alternative method of managing intrusive thoughts. It is a core element of ACT. In ACT, clients are encouraged to make willing contact with aversive psychological content. Cognitive defusion techniques are often employed in ACT interventions to achieve this. ACT explicitly states that the modification of problematic private events in function, and not in form or frequency, is the aim of treatment (Hayes, Strosahl, & Wilson, 1999). From an ACT perspective, clients are frequently fused with painful or negatively evaluated psychological content and defusion strategies create a defused perspective that allows greater behavioural flexibility. Titchener's (1916) rapid word-repetition technique is perhaps the most well-known method for facilitating defusion. Within ACT, clients are encouraged to repeat negative words rapidly (e.g. "stupid, stupid, stupid"). The therapeutic aim of this strategy is that, during the repetition task, the semantic functions (i.e. meaning) of the word will be significantly reduced. Clients have reported that towards the end of the exercise they experience the words simply as a strange sound (Hayes, Strosahl, & Wilson, 1999). The therapist then uses this experience to

highlight that the client's negative thought content is purely verbal and not a reflection of reality.

Although cognitive defusion strategies are frequently used within an ACT-based clinical context, the empirical evidence to support their efficacy is relatively limited (Healy et al., 2008). Watson, Burley, and Purdon (2010) examined the effects of the cognitive defusion strategy of verbal repetition on appraisal of contamination-related thoughts, typical of those experienced by individuals with OCD. They compared verbal repetition to brief imaginal exposure and no intervention (control). In the verbal repetition condition, participants were asked to engage in 30 seconds of repeating contamination words (e.g. disease, germs) loudly and as fast as possible. Those in the imaginal exposure condition were asked to imagine scenes involving contamination words for 30 seconds. Participants in the control condition were requested to sit quietly. Following the intervention, participants in the verbal repetition and imaginal exposure groups were asked to practise their intervention over the next week. Results showed that relative to imaginal exposure and control conditions, verbal repetition was associated with a greater decrease in negative appraisal ratings (believability, meaningfulness, distress) at post-intervention and at follow-up (1 week later). Positive findings for cognitive defusion have also been reported in relation to self-referential negative thoughts (Deacon, Fawzy, Lickel, & Wolitzky-Taylor, 2011; Healy et al., 2008; Masuda, Hayes, Sackett, & Twohig, 2004; Masuda et al., 2009, Masuda, Feinstein, Wendell, & Sheehan 2010; Masuda, et al., 2010). One limitation of these studies is that they were laboratory-based experiments, apart from the follow-up periods employed in Deacon, Fawzy, Lickel, and Wolitzky-Taylor (2011) and Watson, Burley, and Purdon (2010). Therefore, they are somewhat lacking in ecological validity.

## **1.2 Rationale**

The current study compared the effectiveness of suppression and cognitive defusion in participants' day-to-day environment over a period of six days. It improved on methodological limitations in the existing literature. Specifically, it employed a longer experimental period, incorporated a baseline monitoring period, and took place in the participant's natural environment. The study also recruited an analogue sample of

participants, who rated highly for obsessionality, and asked them to monitor personally relevant intrusive thoughts.

### **1.3 Aims and hypotheses**

#### ***1.3.1 Aims***

To employ a naturalistic experimental design to compare the effects of thought suppression and a cognitive defusion technique on thought frequency and distress in a non-clinical, highly obsessional cohort. It was anticipated that findings would have clinical implications relevant to both traditional CBT and ACT-based interventions for OCD.

#### ***1.3.2 Hypotheses***

The instruction to suppress intrusive thoughts would:

- increase intrusive thought frequency during suppression and in the subsequent monitoring phase relative to baseline. That is, immediate enhancement and rebound effects were predicted.
- increase distress during suppression and in the subsequent monitoring phase relative to baseline.

The instruction to defuse from intrusive thoughts would:

- not result in any change in intrusive thought frequency.
- decrease distress during the defusion phase relative to baseline.

## **2. Method**

### **2.1 Design**

The study had an experimental 2 (group) x 3 (phase) mixed model design. Participants were randomised to a suppression or defusion condition. Sixty envelopes were prepared, half with “S” written inside, the other half with “CD”. Participants selected one of the sealed envelopes and were assigned to an experimental group accordingly. The experiment took place over a 6-day period. Participants were asked to monitor their intrusive thoughts for an initial two days (baseline monitoring phase). They were then asked to suppress these thoughts or employ a cognitive defusion technique for the following two days. On the final

two days, they were asked to return to simply monitoring their thoughts. The baseline monitoring period allowed participants to act as their own controls. The dependent variables were intrusion frequency, associated distress and believability, and appraisals of intrusions. The primary dependent variable was thought frequency.

## **2.2 Ethical Approval**

Ethical approval was obtained from the University of Glasgow Ethics Committee in September 2012 (see approval documentation in Appendix 2.1). An amendment was made to the ethics application in January 2013 to allow the researcher to include individuals scoring within the severe range on the Hospital Anxiety and Depression Scale (HADS). Approval was granted for this amendment, provided that the researcher nominated an independent person as a support contact for participants, rather than the researcher being the sole support contact. Consequently, a clinical psychologist was identified, whose contact details were provided to participants.

## **2.3 Power Calculation**

Power calculations using G-POWER (Erdfelder, Faul, & Buchner, 1996) were completed to determine the required sample size based on the primary hypothesis. This hypothesis predicted a significant effect of experimental group (suppression, defusion) on thought frequency over three time points using repeated measures analysis of variance (ANOVA). Methodology employed in previous research was not sufficiently comparable to estimate effect sizes for the current study. Therefore, Cohen's effect size (f) conventions for ANOVA (Cohen, 1977, 1988) were used with values of 0.1, 0.25, and 0.4 corresponding to small, medium, and large effect sizes, respectively. The following assumptions were made: rho was conservatively predicted to be 0.3; and significance level was taken as .05. Results indicated that for "medium" effect sizes, a total sample size of 44 would have adequate power (>0.80). Therefore, the researcher aimed to have 30 participants in each group to allow for participants dropping out of the study or not completing measures.

## **2.4 Participants**

Students from various colleges (i.e. College of Arts, College of Medicine, Veterinary, and Life Sciences, College of Science and Engineering) at the University of Glasgow were sent



an invitation email asking if they experienced intrusive thoughts and if they would like to participate in a study about such thoughts (Appendix 2.2). A link to an electronic screening questionnaire, namely the Obsessional Intrusions Subscale of the Clark-Beck Obsessive Compulsive Inventory (CBOCI; Clark & Beck, 2002), and a participant information sheet (Appendix 2.3) was provided. Between November 2012 and May 2013, 169 students completed the screening measure, 147 of whom met inclusion criteria, defined as a score of  $\geq 12$  on the Obsessions Subscale of the CBOCI (equating to one standard deviation below the clinical mean). Suitable individuals were then contacted by email or telephone. Individuals receiving current psychiatric or psychological treatment were excluded from further participation in the study ( $n=4$ ), 11 declined further participation, and it was not possible to contact 64 individuals. One additional student was excluded at this stage, as she was conducting research in a similar area. Therefore, it was felt that she could potentially bias the results. Finally, four individuals, who had completed the online survey, were thanked for their participation in this stage of the study but told that they would not be required to participate in the experimental stage. The reason being that by this point, it was deemed that a sufficient sample size had been achieved.

Appointments to meet with the researcher were arranged with 63 individuals in total. Of these, one was excluded because she scored within the severe range for anxiety on the HADS (before the amendment to the ethics application was approved). Two further individuals could not identify a personally-relevant intrusive thought for use in the study and were therefore excluded. The remaining 60 individuals gave written informed consent (see Consent form in Appendix 2.4) and were randomised into the study.

## **2.5 Measures**

*Clark-Beck Obsessive Compulsive Inventory - Obsessional Intrusions Subscale (CBOCI; Clark & Beck, 2002)*

The CBOCI is a 25-item screen for the frequency and severity of Diagnostic and Statistical Manual of Mental Disorders - 4th edition (DSM-IV) obsessive and compulsive symptoms, designed to complement the Beck Depression Inventory-II. The CBOCI consists of validated subscales for obsessions and compulsions with each item rated on a 4-point scale (0-3). The measure demonstrates excellent internal consistency ( $\alpha=0.95$ ), good convergent validity ( $r=0.78$ ), and adequately distinguishes between clinical and non-clinical individuals.

*Obsessive Compulsive Inventory – Revised (OCI-R; Foa et al, 2002)*

The OCI-R is a revision of the Obsessive Compulsive Inventory (OCI; Foa, Kozak, Salkovskis, Coles, & Amir, 1998). It consists of 18 items assessing the severity and frequency of OCD symptoms. Each item is rated on a 5-point scale according to level of distress. The OCI-R demonstrates good internal consistency ( $\alpha=0.81$ ). A cut-off score of 21 distinguishes OCD clients from non-anxious controls (Foa et al., 2002).

*Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983)*

The HADS is a fourteen-item scale. Seven of the items relate to anxiety and seven relate to depression. It has been found to perform well in assessing the symptom severity of anxiety disorders and depression in the general population (Bjelland, Dahl, Haug, & Neckelmann, 2002).

*Thought Control Questionnaire (TCQ; Wells & Davies, 1994)*

The TCQ is a 30-item questionnaire used to assess frequency of thought control strategies on a 4-point scale. The TCQ has 5 subscales (worry, distraction, punishment, social support, and reappraisal), which possess adequate internal consistency ( $\alpha=0.64-0.83$ ; Wells & Davies, 1994).

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

The AAQ-II is a 7-item questionnaire designed to assess the construct referred to variously as acceptance, experiential avoidance, and psychological inflexibility. Results indicate satisfactory structure, reliability, and validity of this measure (Bond et al., 2011).

Appraisals of intrusions (e.g. unpleasant, unacceptable) were measured using Visual Analogue Scales (VAS) (Appendix 2.5). Appraisal items were based on questions from Part II of the Revised Obsessional Intrusions Inventory (ROII, Purdon & Clark, 1994).

Frequency of intrusive thoughts was measured by a hand-held golf tally counter. This method has been employed previously in studies of intrusive thoughts (e.g. McLean & Broomfield, 2007; Marcks & Woods, 2005).

A Daily Diary (Appendix 2.6) was provided to participants to record thought frequency, VAS ratings of believability and distress associated with intrusive thoughts, as well as

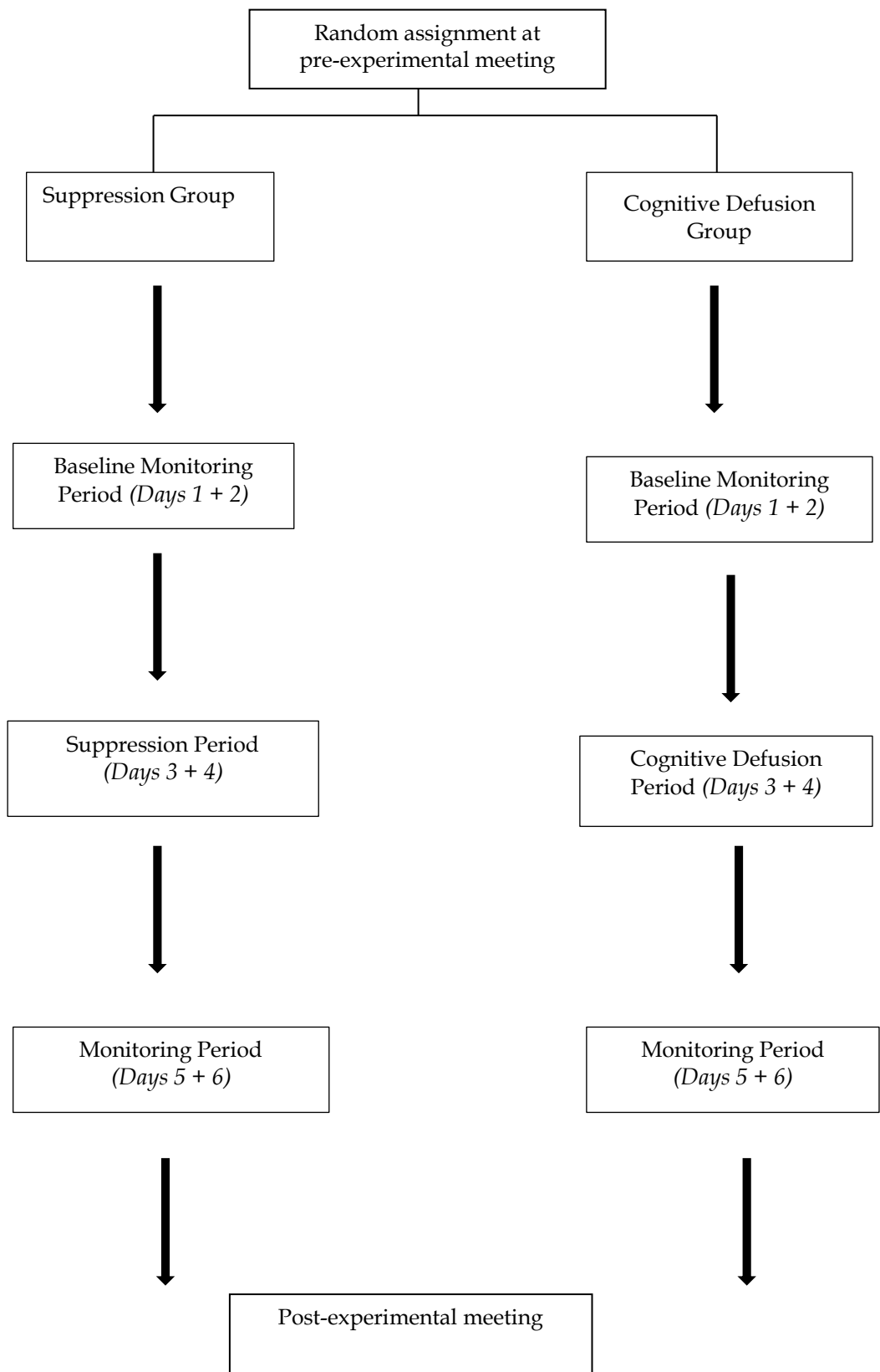
compliance with and ease of use regarding the suppression and cognitive defusion instructions.

## **2.6 Procedure**

The experimental phase of the study was conducted over a 6-day period for each participant (see Figure 1 below). The researcher met with participants on a one-to-one basis at the start and end of this period. At the pre-experimental meeting, participants provided demographic data and completed baseline measurements for the HADS, OCI-R, and AAQ-II. The researcher then read out a description of an intrusive thought (Appendix 2.7) before asking participants to identify a personally-relevant intrusive thought experienced within the past week and which was likely to be still bothering them over the upcoming week. The thought description was based on instructions from the Interpretation of Intrusions Inventory (III; Obsessive Compulsive Cognitions Working Group, 2005). If participants experienced difficulty identifying an intrusive thought, they were provided with part one of the ROII as a prompt to help identify one. If this was unsuccessful, they were excluded from the study. Once a personally-relevant intrusive thought was identified as a target thought for the purposes of the study, participants were asked to think about this thought for 30 seconds as a priming exercise before completing the VAS-based appraisals of the thought. They were then given both verbal and written instructions for the baseline thought monitoring period and a copy of the Daily Diary. Following randomisation to suppression or cognitive defusion, participants were provided with sealed envelopes with instructions for their allocated group and for the final thought monitoring period. Participants were requested to open their instructions on the relevant days (i.e. days 3 & 5). They also received a text message on the morning of these days as a reminder to open their envelopes. See Appendices 2.8, 2.9, and 2.10 for descriptions of how instructions were provided to participants for thought monitoring, suppression, and cognitive defusion.

At the post-experimental meeting, it was checked if participants had received the text messages to open their envelopes. The researcher also checked if participants had received the correct set of instructions (i.e. suppression or cognitive defusion). They were then asked to complete the same priming exercise and VAS questionnaire as at the pre-experimental meeting. Participants in the suppression group were also asked to complete the Thought Control Questionnaire, as it related to strategies employed on days three and

four of the experiment. Finally, all participants were debriefed about the study and thanked for their time.



**Fig 1: Study Schedule**

## **2.7 Data Analysis**

Raw data were anonymised and then analysed using PASW Statistics 18. Independent *t*-tests for continuous data and Chi-squared tests for categorical data were used to examine differences between groups. Mann-Whitney *U* tests were used for data that were not normally distributed. To examine the main hypotheses, each dependent variable was analysed using a mixed 2 x 3 repeated measures ANOVA. Pre- and post-experimental appraisal ratings were analysed using mixed 2 x 2 repeated measures ANOVAs. Data were first tested for normality. Where appropriate, transformations were employed. The assumptions of sphericity ( $p>.05$ ) and homogeneity of variance ( $p>.05$ ) were met for dependent variables, unless otherwise specified.

## **3. Results**

### **3.1 Preliminary Analyses**

Sixty participants were randomised to either a suppression (S) or cognitive defusion (CD) group. Six of these participants (S=3, CD=3) were excluded from the final analysis due to reporting a low number of thoughts throughout the week (total of  $\leq 5$  thoughts). These participants were not deemed to meet criteria for ‘high obsessionality’. Another participant (S) was excluded because she counted her compulsive behaviours rather than her intrusive thoughts. Two participants (S=1, CD=1) withdrew from the experiment and a further two participants (S=1, CD=1) were excluded as it came to light post-randomisation that they were being treated by a psychologist or psychiatrist. Therefore, a total of 49 participants were included in the final analysis (S=24, CD=25). Participants who had incomplete diary ratings were excluded from analysis of the corresponding variables.

#### **3.1.1 Participant Characteristics**

Table 1 details participant characteristics for each group. Median scores are presented for age, CBOCI, and HADS (depression) scores, as these data were not normally distributed. Participants in both groups scored within the “mild to moderate clinical” range on the intrusions subscale of the CBOCI, a symptom-screening instrument. They also scored above the recommended clinical cut-off score of 21 on the OCI-R (indicates the likely presence of OCD). HADS scores indicated that participants were on average in the “normal” range for depression and at the upper end of the “mild” range for anxiety. AAQ2

scores suggested probable clinical distress. No significant differences were found between groups regarding gender, age, or scores on the CBOCI-Intrusions Subscale, OCI-R, HADS, or AAQ2.

**Table 1**  
Participant Characteristics and Corresponding Analysis

Characteristic	Suppression (n=24)	Cognitive Defusion (n=25)	Statistic
Sex (F:M ratio)	19:5	18:7	$\chi^2 = 0.6, p = .80$
Age (median, IQR)	22.50 (5.75)	21.00 (3.50)	$U = 251.00, z = -0.99, p = .32$
CBOCI-Intrusions (median, IQR)	15.50 (7.00)	18.00 (9.00)	$U = 230.50, z = -1.40, p = .16$
OCI-R (mean, SD)	24.83 (14.12)	25.04 (13.10)	$t = -0.05, p = .96$
HADS-Depression (median, IQR)	3.50 (4.75)	4.00 (4.00)	$U = 248.50, z = -1.04, p = .30$
HADS-Anxiety (mean, SD)	10.20 (3.51)	10.84 (3.48)	$t = -0.63, p = .53$
AAQ2 (mean, SD)	25.91 (8.43)	27.44 (7.48)	$t = -0.67, p = .51$

The content of participants' target intrusive thoughts is presented in Table 2.

**Table 2**  
Content of Intrusive Thoughts

Intrusion Type	n
The thought that something bad will happen because you were not careful enough	12
Thought of harming self or others despite not wanting to hurt self/others	12
Thoughts about contamination/dirt	4
Thought of something bad happening to a loved one	4
Thought that objects are not arranged perfectly	3
Thought of doing something inappropriate or embarrassing	2
Thoughts questioning feelings for intimate partner	2
Unwanted/inappropriate sexual thoughts	2
Thoughts that are contrary to personal moral beliefs	1
Other	7

### 3.1.2 Compliance with Experimental Instructions

Effort ratings during Phase 2 were examined to measure compliance with the experimental instructions. The median scores for the Suppression and Cognitive Defusion groups were 79.25 ( $IQR=34.50$ ) and 69.50 ( $IQR=23.75$ ), respectively. Effort ratings did not differ significantly between the two groups ( $U=248.50$ ,  $z=-1.03$ ,  $p=.30$ ). Participants were also asked how easy they found it to follow the experimental instructions in Phase 2. There was a significant difference in scores for the Suppression ( $M=56.40$ ,  $SD=27.45$ ) and Cognitive Defusion groups ( $M=71.52$ ,  $SD=18.18$ ) [ $t(47)=-2.28$ ,  $p<.05$ ], with the Cognitive Defusion group finding the instructions easier to follow.

### 3.2 Tests of the Main Hypotheses

To examine the main hypotheses, variables corresponding to target thought occurrences and distress were analysed using mixed 2 (Group: Suppression, Cognitive Defusion) by 3 (Time: Phase 1, Phase2, Phase 3) repeated measures ANOVAs. An identical ANOVA was applied to the believability variable. Table 3 provides a summary of the main findings from the experimental week.

**Table 3**

Diary Ratings of Target Intrusion across Groups and Experimental Phases

Dependent Variable	Suppression (n=24) <i>Median (IQR)</i>	Cognitive Defusion (n=25) <i>Median (IQR)</i>
<b><i>Phase 1: Monitor</i></b>		
Tally frequency (number of thoughts)	6.00 (13.25)	5.50 (10.00)
Time spent thinking about intrusion (0-100)	23.75 (25.38)	25.00 (21.75)
Distress (0-100)	26.00 (25.00)	35.50 (38.50)
Believability (0-100)	35.25 (43.38)	26.00 (56.50)
<b><i>Phase 2: Experimental Phase</i></b>		
Tally frequency (number of thoughts)	7.00 (6.75)	6.00 (6.50)
Time spent thinking about intrusion (0-100)	27.25 (34.25)	25.50 (32.50)
Distress (0-100)	21.25 (28.75)	38.50 (37.00)
Believability (0-100)	35.25 (31.88)	29.00 (48.25)
<b><i>Phase 3: Monitor</i></b>		
Tally frequency (number of thoughts)	4.50 (7.25)	4.50 (6.25)
Time spent thinking about intrusion (0-100)	15.50 (19.00)	24.50 (33.50)
Distress (0-100)	18.50 (34.00)	27.00 (25.75)
Believability (0-100)	25.50 (43.50)	18.00 (39.50)

Notes: Each phase consisted of 2 days. An average VAS score was calculated over the 2 days.

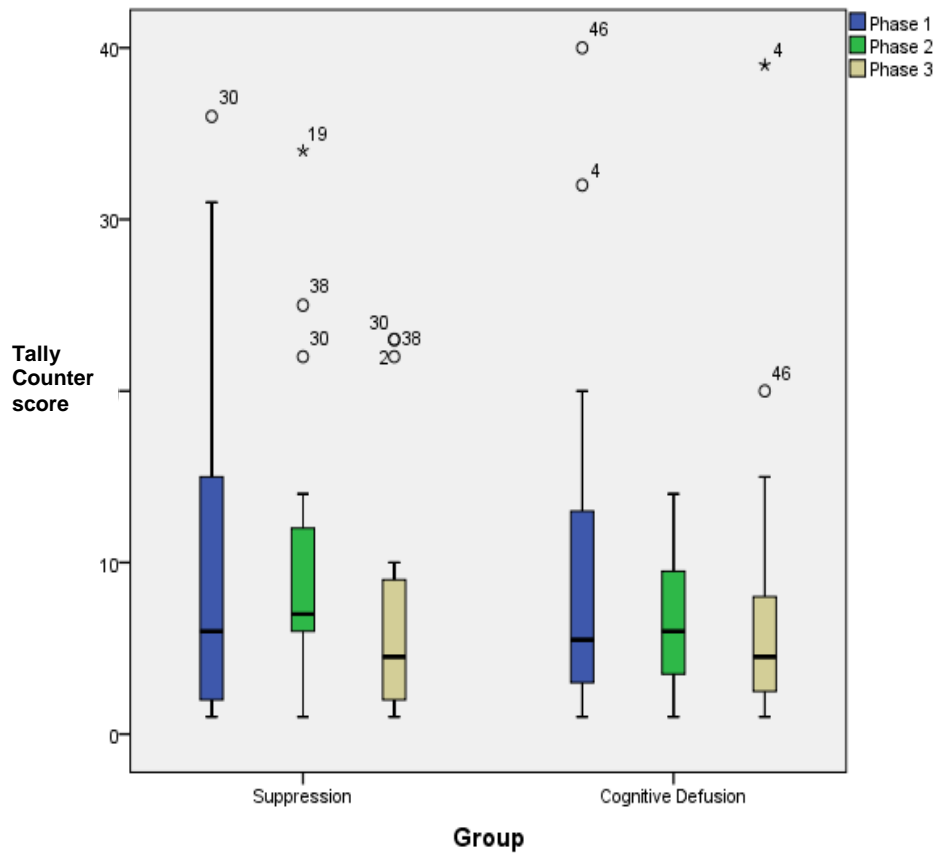
Tally frequency score is the total number of thoughts for each phase.

### ***3.2.1 Effects on Thought Frequency and Time Spent thinking about Intrusive Thoughts***

At the post-experimental meeting, participants were asked to estimate the accuracy of their tally counter scores from 0 to 100%. The median score was 90% ( $IQR=13.75$ ). Furthermore, participants were asked to provide an estimate of the number of their intrusive thoughts at the end of each day during the experimental week. The correlations between tally counter scores and these estimates at Phase 1 ( $rs=.98, n=46, p<.001$ ), Phase 2 ( $rs=.93, n=46, p<.001$ ), and Phase 3 ( $rs=.85, n=45, p<.001$ ) were all significant, suggesting that the tally counter scores provided a valid measure of number of intrusive thoughts.

Four outliers in the tally frequency data were changed to be one unit above the next highest score, as recommended in Field (2009). A square root transformation was then applied. No significant Phase x Group interaction effect was found, [ $F(2, 88)=1.49, p=.23$ , partial  $\eta^2=.03$ ]. Similarly, no significant main effect was found for Group [ $F(1, 44)=0.24, p=.63$ , partial  $\eta^2=.01$ ]. A significant main effect was found for Phase [ $F(2, 88)=3.72, p<.05$ , partial  $\eta^2=.08$ ]. Pairwise comparisons were conducted employing Bonferroni adjustment for multiple comparisons. These comparisons revealed that tally counter scores were significantly lower in Phase 3 than in Phase 1 ( $p<.05$ ). There were no significant differences between Phases 1 and 2 ( $p=1.00$ ) or Phases 2 and 3 ( $p=.17$ ) (see Figure 2).





Note: Box lengths represent interquartile ranges and lines across the inside of boxes are the median values.

**Fig. 2:** Tally Counter scores across Phases

A second measure of target thought occurrences was employed, namely time spent thinking about the thought. A log transformation was applied to these data. No significant effects were found for Phase [ $F(2, 92) = 0.95, p=.39$ , partial  $\eta^2=.02$ ], Group [ $F(1, 46)=1.35, p=.25$ , partial  $\eta^2=.03$ ], or Phase x Group interaction [ $F(2, 92)=1.33, p=.27$ , partial  $\eta^2=.03$ ].

### 3.2.2 Effects on Distress

A square root transformation was applied to distress scores. No significant effects were found for Phase [ $F(2, 92)= 0.88, p=.42$ , partial  $\eta^2=.02$ ], Group [ $F(1, 46)= 2.26, p=.14$ , partial  $\eta^2=.05$ ], or Phase x Group interaction [ $F(2, 92)=0.01, p=.99$ , partial  $\eta^2=.00$ ].

### 3.3 Test of additional variable - Believability

A log transformation was applied to believability scores. Transformed believability scores for Phases 2 and 3 failed to meet the assumption of homogeneity of variance. However, it should be noted that sample sizes were substantial and almost equivalent across the two groups (Suppression,  $n=23$ ; Cognitive defusion,  $n=25$ ). In any event, no significant effects were found for Phase [ $F(2, 92)=1.58, p=.21$ , partial  $\eta^2=.03$ ], Group [ $F(1, 46)= 0.69, p=.41$ , partial  $\eta^2=.02$ ], or Phase x Group interaction [ $F(2, 92)=0.27, p=.76$ , partial  $\eta^2=.01$ ].

### 3.4 Thought Control Strategies

Participants in the Suppression group were asked to complete the Thought Control Questionnaire in relation to the strategies they used to suppress their intrusive thoughts during Phase 2. As can be seen from Table 4, distraction was the most frequently employed thought control strategy, whereas social control (i.e. discussing the thought with others) was the least frequently used strategy.

**Table 4**

Thought Control Strategies employed by Suppression Group in Phase 2

<b>TCQ Sub Scale (Possible Range = 6-24)</b>	<b>(<math>n=24</math>) <i>Md (IQR)</i></b>
Distraction	15.00 (6.25)
Re-appraisal	12.00 (6.25)
Punishment	10.00 (4.50)
Worry	8.00 (4.50)
Social Control	7.00 (6.75)

### 3.5 Pre- and Post-experimental Appraisal Ratings of Target Intrusion

Appraisal ratings were analysed to examine whether the experimental manipulations had any effect on the interpretation of target intrusions. Scores were analysed using mixed 2 (Group: Suppression, Cognitive Defusion) by 2 (Time: Pre-experimental, Post-experimental) repeated measures ANOVAs. Square root transformations were applied to the scores for questions concerning guilt and harm. Descriptive statistics for appraisals are presented in Table 5.

**Table 5****Appraisal Ratings of Intrusive Thoughts**

<b>Appraisal Ratings (0-100)</b>	<b>Suppression Median (IQR)</b>	<b>Cognitive Defusion Median (IQR)</b>
<i><b>Pre-experimental</b></i>		
Unpleasant	70.50 (32.50)	65.00 (46.50)
Guilty	43.00 (35.75)	55.00 (55.50)
Unacceptable	53.50 (60.75)	41.00 (73.50)
Suppression	65.00 (37.75)	75.00 (35.50)
Harm	26.00 ( 53.50)	53.00 (74.00)
Responsible	59.00 (78.25)	64.00 (83.00 )
Worry	62.50 (28.25)	72.00 (42.50)
Eliminate	71.50 (35.25)	69.00 (35.00)
<i><b>Post-experimental</b></i>		
Unpleasant	62.00 (31.00)	47.00 (50.75)
Guilty	30.00 (47.00)	24.50 (56.50)
Unacceptable	52.00 (59.00)	47.50 (70.00)
Suppression	59.00 (59.00)	61.50 (23.75)
Harm	14.00 (58.50)	59.50 (63.25)
Responsible	38.00 (70.00)	42.50 (59.50)
Worry	51.00 (31.00)	44.50 (57.75)
Eliminate	35.00 (36.00)	50.00 (40.50)

There was a significant main effect of time for five of the eight appraisal ratings. These results were as follows: worry [ $F(1,45)=16.82$ ,  $p<.001$ , partial  $\eta^2=0.27$ ]; eliminate [ $F(1,45)=28.76$ ,  $p<.001$ , partial  $\eta^2=0.39$ ]; responsibility [ $F(1,45)=5.36$ ,  $p<.05$ , partial  $\eta^2=0.11$ ]; guilt [ $F(1,45)=18.11$ ,  $p<.001$ , partial  $\eta^2=0.29$ ]; suppression [ $F(1,45)=6.09$ ,  $p<.05$ , partial  $\eta^2=0.12$ ]. Post-experimental scores for the appraisal question concerning suppression violated the assumption of homogeneity of variance. It should be noted, however, that sample sizes were substantial and almost identical in the suppression and cognitive defusion groups ( $n=23$ ,  $n=24$ , respectively). For all eight appraisal ratings, there were no significant main effects for group or interaction effects ( $ps>.05$ ).

## 4. Discussion

### 4.1 Findings

This study examined the effects of thought suppression and cognitive defusion on the occurrence of obsessional intrusive thoughts and associated distress and believability. It was hypothesised that suppression would increase intrusive thought frequency both during suppression (immediate enhancement) and in the subsequent monitoring phase (rebound

effect) relative to baseline. Furthermore, it was hypothesised that these increases would be associated with increased distress. The hypotheses regarding increased thought frequency were based on the so-called “white bear” effect. However, the findings of this study did not support these hypotheses. No increase in thought frequency was detected in the suppression or post-suppression phases. In fact, a *decrease* in intrusive thought frequency was observed in the post-suppression phase relative to the baseline phase. Furthermore, no significant changes in distress were detected over the course of the experimental week. In sum, there was no evidence for immediate enhancement or rebound effects, contrary to findings from some previous studies (e.g. Lavy & van den Hout, 1990; Salkovskis & Campbell, 1994; Wegner, Schneider, Carter, & White, 1987). Nevertheless, the lack of immediate enhancement and rebound effects is consistent with findings from a similar naturalistic study of obsessional thoughts (Ralston, 2011).

When participants in the suppression group were asked to indicate how often they used various thought control techniques during the suppression phase, they rated distraction as their most frequently used strategy. There is reason to believe that participants’ use of distraction during suppression may have contributed to these null findings. Wegner, Schneider, Carter, and White (1987) conducted a “white bear” experiment, in which one group was instructed to use focused distraction during thought suppression (i.e. “If you do happen to think of a white bear, please try to think of a red Volkswagen instead”). The rebound effect was reliably reduced in this group compared to a group not using focused distraction during suppression. Furthermore, Lavy and van den Hout (1990), who found evidence for an immediate enhancement effect during suppression, pointed out that the results of pilot studies showed that it was necessary to add to the suppression instructions that participants should not use deliberate distraction techniques. Therefore, it is unclear if they would have been able to show this effect if distraction had been allowed. The results of a study by Salkovskis and Campbell (1994) also suggested that distraction could play an important role in moderating the effects of thought suppression. They found an immediate enhancement effect for participants instructed to suppress their intrusive thoughts and participants instructed to suppress their thoughts by distracting themselves (without specifying this further). However, there was no enhancement effect for participants provided with a specific distraction task to perform at the same time as suppressing their thoughts. The above results suggest that it is possible that participants’ use of some type of

focussed distraction in the naturalistic setting of the current study explains the lack of immediate enhancement or rebound effects.

In relation to cognitive defusion, it was hypothesised that defusing from intrusive thoughts would not result in any change in intrusive thought frequency. This was indeed found to be the case. However, there was an unexpected decrease in intrusive thought frequency in phase 3 compared to phase 1. It was also hypothesised that cognitive defusion would decrease distress during the defusion phase relative to baseline. In addition, the effect of cognitive defusion on believability was explored. Cognitive defusion has previously been shown to produce superior results to distraction (Masuda, Feinstein, Wendell, & Sheehan, 2010; Masuda, et al., 2010) and imaginal exposure (Watson, Burley, & Purdon, 2010), and similar results to other active treatment conditions, namely cognitive restructuring (Deacon, Fawzy, Lickel, & Wolitzky-Taylor, 2011) and suppression (Pilecki & McKay, 2012) in reducing distress and believability of negative thoughts. In the present study though, there was no change in distress or believability for the cognitive defusion group.

From an ACT perspective, the aim of defusion is not to control or get rid of unwanted thoughts or reduce the painful feelings associated with them. The aim of defusion is to reduce the influence of unhelpful thoughts/feelings upon behaviour. Mindful, values-congruent living is the desired outcome in ACT, not symptom reduction. So, although ACT typically reduces symptoms, this is not the goal (Harris, 2009). Therefore, the findings that thought frequency and distress remained unchanged during the cognitive defusion phase are not inconsistent with the ACT conceptual framework.

Similarly, reducing believability is not considered to be an important goal in ACT. Fusion is not the same as believability. One can defuse from a thought that is believable. For example, if someone were suffering from a terminal illness, there would be a time and place when it would be useful to think about dying (i.e. writing a will, making medical care arrangements). However, there are other times when it would be useful to defuse from these thoughts and allow them to come and go, without getting caught up in them (e.g. if they were stopping that person from pursuing a valued activity). When individuals defuse from thoughts, they often do reduce in believability. However, from an ACT perspective,

this is not important (Harris, 2009). Therefore, the finding that believability did not change in the current study is again consistent with the purpose of defusion within ACT. It should also be noted that the cognitive defusion instructions employed specifically stated that participants should not focus on whether their target thought was true or false but on whether it would help them create a richer, fuller, and more meaningful life if they let it guide their behaviour. This contrasts with the cognitive defusion instructions of previous studies that showed a reduction in believability (i.e. Deacon, Fawzy, Lickel, & Wolitzky-Taylor, 2011; Masuda, Feinstein, Wendell, & Sheehan, 2010; Masuda, et al., 2010). These studies emphasized a reduction in the literality and meaning of thoughts rather than reducing their impact on behaviour. This could help explain the difference in findings.

This study showed that both suppression and cognitive defusion groups experienced reductions in the following negative appraisals of intrusive thoughts from pre- to post-experiment: worry about acting on the thought or that it might otherwise happen in real life; difficulty eliminating the thought; feeling of responsibility for harm occurring to oneself or others upon having the thought; feeling guilty when the thought enters one's head; and importance of suppressing the thought. It is interesting, in this regard, that re-appraisal was rated as the second most frequently used thought control technique by participants, when they were instructed to suppress their target thoughts.

Cognitive theories of OCD highlight the importance of appraisals of intrusive thoughts. For example, Rachman (1997) proposed that obsessions were caused by catastrophic misinterpretations of the significance of one's thoughts. A relationship has also been identified between OCD and a cognitive bias called thought-action fusion (Rachman, 1993). This bias can take one of two forms – the belief that having the thought may actually influence the probability that the aversive event will occur and the belief that having a repugnant unacceptable thought is morally equivalent to carrying out the relevant action. Similarly, Salkovskis (1999) proposed that the key to understanding obsessional problems lies in the way in which intrusive thoughts are interpreted. Furthermore, the important negative interpretations usually concern the idea that the person's action (or choice not to act) could result in harm to oneself or others. This responsibility interpretation has several consequences, namely motivating neutralising behaviour and other counterproductive strategies, such as increasing selective attention, and increased

negative mood. These strategies serve to maintain the negative beliefs and therefore the obsessive-compulsive behaviour. Cognitive behavioural interventions for OCD have arisen from cognitive theories of OCD. A particularly important element in these interventions involves encouraging patients to construct alternative interpretations of their intrusive thoughts and to match the available evidence for and against the original catastrophic significance and these alternatives. This may include behavioural experiments designed to collect new evidence that permits tests of the different interpretations. Most therapy techniques focus on reappraisal and a key component of this is normalising the significance of the occurrence and content of intrusions. Accordingly, the current findings pertaining to post-experimental improvements in negative appraisals are promising. Furthermore, it is possible that these changes may have contributed to the reduction in the frequency of intrusive thoughts in the final phase of the experiment. However, it is unclear when the changes in appraisals took place, as appraisal measurements were only taken before and after the experiment. Therefore, it is impossible to tell if they occurred prior to the final phase of the experiment.

As discussed above, suppression and cognitive defusion appeared to have similar beneficial effects, at least in the short term, in relation to the frequency of intrusive thoughts and their appraisal. However, one advantage of cognitive defusion was identified, namely that cognitive defusion instructions were rated as being easier to follow.

## **4.2 Strengths and Limitations**

The sample was restricted to non-clinical university students. Although participants were screened for obsessional intrusions and participants scored within clinical ranges on self-report measures of OCD, they were not seeking help in relation to their intrusions. This could limit the generalisability of the results. However, there is some evidence to suggest that this might not necessarily be the case. Magee, Harden, and Teachman (2012), in their meta-analytic review of thought suppression, examined the difficulty of thought suppression according to the presence or absence of psychopathology. Results indicated that during the immediate enhancement thinking period, difficulty with thought suppression attempts was similar between psychopathological and non-clinical samples. There was also little difference between these samples for the rebound thinking period.

This suggests that thought suppression is associated with similar recurrence of thoughts (compared to control instructions) in samples with and without psychopathology.

One of the strengths of this study is that it was conducted over a 6-day period. As mentioned previously, much of the thought suppression literature is based on studies conducted in laboratories lasting only minutes. However, it would also be interesting to explore what the longer-term effects of these interventions might have been. In particular, it would be worth examining whether the benefits witnessed lasted over time.

One of the drawbacks of conducting a naturalistic study is that it is impossible to control for situational factors that may have contributed to thought occurrences. However, it was decided to conduct such a study in an effort to counteract the general lack of ecological validity in previously published research due to a reliance on laboratory-based studies.

Similar to the majority of other studies in this area, the study did not control for the effects of social desirability on ratings of thought occurrences. This has particular relevance for the suppression group who may have reduced reporting of intrusive thoughts in line with instructions to suppress these thoughts. However, the fact that participants only reported a reduction in thought frequency in the final phase of the study and not in the suppression phase suggests that social desirability was not especially prominent.

Another limitation of the current study is the lack of a control group. Use of an inert control group that controlled for non-specific features of the other two interventions would have allowed one to rule out more easily any placebo or social desirability effects or regression to the mean in accounting for the reduction in thought frequency over time. However, interestingly, there were only improvements on a limited number of measures in this study, which suggests that these factors may not have been overly important in the study.

Finally, in relation to cognitive defusion, it is believed that a measure of the impact of this technique on behaviour would have provided a more appropriate measure of its effectiveness. This represents a limitation to the findings of the study, given the emphasis in the cognitive defusion instructions on the link between target intrusive thoughts and behaviour. Considering that obsessional thoughts are associated with neutralising



compulsive behaviours, it is recommended that future studies using cognitive defusion with these thoughts examine if defusion has any impact on the performance of compulsions.

### **4.3 Implications**

It has become customary to think of thought suppression as a unitary phenomenon. However, there is a large literature on the various avoidance and escape-oriented strategies people may resort to when confronted with intrusive cognitions. These strategies have been labelled blunting, distraction, and retrieval inhibition amongst others. According to Rassin, Merckelbach, and Muris (2000), the thought suppression research domain would benefit from a refined classification of avoidant strategies. They also point out that it is highly unlikely that all these strategies have counterproductive effects that contribute to psychopathology. This hypothesis could help explain the failure to find an immediate enhancement or rebound effect for suppression in the current study. The suppression group in the current study rated distraction and reappraisal as the two most frequently used thought control strategies, when they were asked to suppress their intrusive thoughts. Research discussed above suggests that both of these strategies have adaptive qualities. Consequently, it is proposed that rather than ‘banning thought suppression’ as a whole in therapy, it appears important for research to identify maladaptive suppression techniques that should be banned.

Nonetheless, the Wegner, Schneider, Carter, and White (1987) thought suppression paradigm has significantly influenced theoretical models of psychological disorder and subsequent treatment techniques that discourage the use of thought suppression. Salkovskis, Forrester, and Richards (1998) cited thought suppression as a counterproductive “safety strategy” and maintaining factor in their cognitive model of obsessional problems. In addition, Rachman (1998) referred to Wegner’s “white bear” effect in another cognitive theory of obsessions. According to this model, an inflated increase in the significance attached to an unwanted obsessional thought will lead to vigorous attempts to suppress such thoughts. These attempts can then produce an increase in the frequency of the obsession. Furthermore, these paradoxical increases may actually strengthen the catastrophic misinterpretations themselves and a vicious cycle is

established. The inclusion of a demonstration of the paradoxical effects of thought suppression in CBT treatment manuals of OCD also suggests an apparent consensus regarding the harmful effects of thought suppression (Smari, 2001).

However, McLean (2006), in his systematic review of experimental studies examining the effects of thought suppression in OCD, concluded that the studies offered little weight to support the citation of thought suppression in conceptualisations of obsessional problems. He also pointed out that the existing literature was lacking in many respects and urged researchers to move away from the laboratory-based approach and conduct studies over longer time periods and within participants' everyday environment, using clinical samples or participants experiencing high levels of obsessive symptomatology. All of these methodical issues were addressed in the current study. Nonetheless, there was still no evidence for the "white bear" effect. Indeed, the findings of this study suggest that suppression may have some beneficial effects, at least in the short-term. Therefore, this study adds to previous evidence to show that the effects of thought suppression are far from clear-cut. This suggests that, in terms of treatment, a reduced focus on the harmful effects of suppression may be warranted.

The findings in relation to cognitive defusion and distress and believability were not as positive as previous studies examining these outcomes for contamination-related thoughts and negative self-referential thoughts. However, it is argued that the outcome measures in this study were not wholly appropriate considering the aim of cognitive defusion in ACT. It is recommended that future research examine more functional effects of cognitive defusion and how it might affect compulsive behaviour. Nonetheless, there were some positive effects associated with cognitive defusion that were similar to the positive effects of suppression. Furthermore, cognitive defusion was superior to suppression in one respect, namely it was easier to follow the cognitive defusion instructions. Given the positive findings of the current study and the limited number of other studies looking at the use of cognitive defusion with obsessional intrusive thoughts, it is recommended that further research be conducted in this area. Such research might explore cognitive defusion's potential for helping individuals with OCD learn to relate to their intrusive obsessions in a way that does not significantly interfere with their normal routine, occupational (or

academic) functioning, or usual social activities or relationships, one of the diagnostic criteria for OCD (American Psychiatric Association, 2000).

#### **4.4 Conclusions**

This study has demonstrated that thought suppression *did not* lead to a paradoxical increase in thought frequency in a highly obsessional sample over a period of six days. Furthermore, there were some positive effects associated with thought suppression. These findings contribute to a body of literature which has failed to find paradoxical detrimental effects associated with thought suppression in OCD. This has implications for the refinement of thought control strategies used during suppression and the theoretical models and treatments of OCD that highlight the harmful effects of suppression.

In relation to cognitive defusion, it was proposed that the outcome measures in this study were not wholly appropriate considering the aim of cognitive defusion. It was recommended that future research examine the more functional effects of cognitive defusion and how it might relate to compulsive behaviour. Despite this, there were positive findings for cognitive defusion in relation to the frequency and appraisals of intrusive thoughts. These findings suggest that further research in this area is warranted.

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CHAPTER THREE: ADVANCED CLINICAL PRACTICE I -  
REFLECTIVE ACCOUNT

**Reflections on my use of time management - “*A man who dares to waste one hour of life has not discovered the value of life*” (Charles Darwin)**

**Bernadette O’ Sullivan<sup>1</sup>**

**<sup>1</sup> Academic Unit of Mental Health and Wellbeing, Institute of Health and Wellbeing,  
University of Glasgow**

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## **Abstract**

I have chosen in my reflective account to reflect on an experience I had during course 12 of my training in relation to carrying out my clinical duties. I employed Gibbs' (1988) model of reflection to guide my reflections. I chose a neuropsychology placement as one of my specialist third year placements. The combination of a high caseload and my lack of experience working in this area made this a very challenging experience for me. I found that I was struggling to keep up with my caseload and this was causing me to feel stressed and somewhat inadequate in my role as a trainee. However, I was able to speak to my supervisor about how I was feeling and he was understanding of my position when he took into account the steep learning curve I faced on this placement. I also had to take into consideration my time management and how this was affecting my performance. Fortunately, following personal reflection and consultation with others, I managed to learn some valuable time management skills and instead of just working harder, I was now able to work in a smarter way. I have long been aware that my time management skills were a particular weakness of mine and I think this is related to my perfectionistic tendencies. Therefore, it came as a welcome relief to me on this placement when I finally learned some skills that allowed me to address this weakness. As a result, I can now work more productively, which will allow me to make time to give to all the valued areas of my life and maintain an important work-life balance. In my account, I have also reflected on the necessity arising from the "Improving Access to Psychological Therapies" HEAT target for all clinical psychologists to be able to work in a highly efficient way to ensure this target is met. Finally, I reflected on how working in an unfamiliar specialist area impacted upon the level at which I was functioning within the Integrated Development Model (Stoltenberg, McNeill, & Delworth, 1998).

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CHAPTER FOUR: ADVANCED CLINICAL PRACTICE II -  
REFLECTIVE ACCOUNT

**“Ready, Steady, Cook” A trainee on the brink of qualification**

**Bernadette O’ Sullivan<sup>1</sup>**

**<sup>1</sup> Academic Unit of Mental Health and Wellbeing, Institute of Health and Wellbeing,  
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## **Abstract**

I have chosen in my reflective account to reflect on my experiences of leading on a service development project on a neuropsychology specialist placement, which involved developing a cognitive screening tool and training non-psychology staff in the use of this tool as well as on legislation relevant to this project. I employed Gibbs' (1988) model of reflection to guide my reflections on this experience. I have considered the role of a clinical psychologist providing training in psychological skills/knowledge within the context of increased public demand for psychological services, the new Health Efficiency Access and Treatment (HEAT) target on improving access to psychological services, and the matched/stepped care model of service delivery. I reflected on my initial anxiety when faced with this task, which was mainly concerned with my under-estimation of the skills I had gained throughout training that enabled me to successfully manage this task. This was a valuable learning experience for me during training and has increased my confidence in my ability to share my psychological knowledge with others and make a valuable contribution to a multidisciplinary team service development. My ability to lead on this project marked for me the progress I had made in my training. In the first year of training, much of my focus was on learning therapeutic skills and learning about psychological models. I was then able to develop and consolidate these therapeutic skills in second year. In the final year of my training, I was given the opportunity to become involved in the other roles of a clinical psychologist, namely service development and staff training. This was a positive experience for me and has increased my confidence in doing this type of work in the future. Writing this reflective account has allowed me to reflect on how my psychological skills have developed over the course of my training. I very much value the training I have received over the past three years and am looking forward to obtaining my first position as a qualified clinical psychologist and using the skills I have learned to work as an effective reflective scientist practitioner.

## Appendix 1.1 Submission Guidelines

Submission Guidelines for *Behaviour Research and Therapy*. Full details can be accessed at:

[http://www.elsevier.com/wps/find/journaldescription.cws\\_home/265?generatepdf=true](http://www.elsevier.com/wps/find/journaldescription.cws_home/265?generatepdf=true)



## BEHAVIOUR RESEARCH AND THERAPY

### AUTHOR INFORMATION PACK

#### TABLE OF CONTENTS

• Description	p.1
• Audience	p.1
• Impact Factor	p.1
• Abstracting and Indexing	p.2
• Editorial Board	p.2
• Guide for Authors	p.4



#### DESCRIPTION

*Behaviour Research and Therapy* encompasses all of what is commonly referred to as **cognitive behaviour therapy** (CBT). The focus is on the following: theoretical and experimental analyses of **psychopathological processes** with direct implications for prevention and treatment; the development and evaluation of empirically-supported interventions; predictors, moderators and mechanisms of behaviour change; and dissemination and implementation of evidence-based treatments to general clinical practice. In addition to traditional **clinical disorders**, the scope of the journal also includes **behavioural medicine**. The journal will not consider manuscripts dealing primarily with measurement, psychometric analyses, and personality assessment.

The Editor and Associate Editors will make an initial determination of whether or not submissions fall within the scope of the journal and/or are of sufficient merit and importance to warrant full review.

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#### AUDIENCE

For clinical psychologists, psychiatrists, psychotherapists, psychoanalysts, social workers, counsellors, medical psychologists, and other mental health workers.

#### IMPACT FACTOR

2011: 3.295 © Thomson Reuters Journal Citation Reports 2012

## Appendix 1.2: Quality Rating Tool

Scoring	Items
	Sample
0-3 0 or 3	1. Is the sample a convenience sample, e.g. clinic attenders, referred clients (score 2) or a geographic cohort, e.g. all clients eligible in a particular area (score 3) or a highly selective sample, e.g. volunteers (score 0) 2. Is the sample size greater than 27 participants in each treatment group (score 3) or based on described and adequate power calculations (score 3)?
	Control conditions
0-3	3. Non-active control condition (score 2) or control condition that controls for non-specific effects or other established or credible intervention (score 3) or no control condition (score 0)
	Interventions
0-3 0-3 0-3	4. Are the interventions of interest clearly described? 5. Are the experimenters clearly described? (i.e. qualifications, experience etc.) 6. Is compliance with the intervention adequate? Score 0 if this was not assessed.
	Allocation
0 or 3 0 or 3 0 or 3	7. Is there random allocation or minimisation allocation to groups? 8. Is the process of randomisation/minimisation described? 9. Are the participants in different intervention groups?
	Assessment
0 or 3	10. Are standardised assessment measures used to assess distress and believability (score 3) or idiosyncratic measures (score 0)
	Analysis
0-3 0 or 3 0-3 0 or 3	11. Baseline characteristics of alternative treatment groups and control groups (if included) were adequately compared (e.g. demographic factors, mental health) 12. Is the analysis appropriate to the design and type of outcome measure? 13. Is there adequate adjustment for confounding in the analyses? 14. Are effect sizes reported?

**Scoring guide 0-3:** Well covered (3), Adequately addressed (2), Poorly addressed (1), Not addressed, not reported (0). Unless otherwise specified. **Scoring guide 0 or 3:** Yes (3), No or not reported (0). **Scoring calculation:** Scores for applicable items are summed and divided by the maximum score possible for the number of applicable items. This number is multiplied by 100 to give a % score.

### Appendix 1.3: Study Scoring Sheet

Study	Deacon et al. (2011)	De Young et al. (2010)	Healy et al. (2008)	Masuda et al. (2004)	Masuda et al. (2009) Exp. 1	Masuda et al. (2009) Exp. 2	Masuda et al. (2009) Exp.s 1+2	Masuda, Feinstein et al. (2010)	Masuda, Feinstein et al. (2010)/ Sub-group	Masuda, et al. (2010)	Masuda, et al. (2010) Sub-group	Pilecki & McKay (2012)	Watson et al. (2010) Study 1	Watson et al. (2010) Study 2
Item 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Item 2	0	3	0	0	0	0	0	0	0	3	0	0	3	3
Item 3	3	3	3	3	0	0	0	3	3	3	3	3	3	3
Item 4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Item 5	0	0	0	0	3	3	3	3	3	3	3	0	0	0
Item 6	2	3	3	0	3	3	3	0	0	2	2	2	0	1
Item 7	3	3	3	NA	3	3	NA	3	NA	3	NA	3	3	3
Item 8	0	0	0	NA	0	0	NA	0	NA	0	NA	0	0	0
Item 9	3	3	0	0	3	3	3	3	3	3	3	3	3	3
Item 10	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Item 11	3	0	2	NA	0	0	0	3	2	3	2	2	2	3
Item 12	2	3	3	3	3	3	3	3	3	3	3	3	3	3
Item 13	0	0	2	1	0	0	0	3	2	3	2	2	2	3
Item 14	3	3	3	0	3	3	3	3	3	3	3	3	0	0
Total	22	24	22	10	21	21	18	27	22	32	24	27	22	25
% score	52	57	52	30	50	50	50	64	61	76	67	64	52	60

## Appendix 2.1: Letter of Ethical Approval



University of Glasgow | College of Medical,  
Veterinary & Life Sciences

Dear BERNADETTE O'SULLIVAN

### MVLS College Ethics Committee

***Project Title: Comparing the effectiveness of thought suppression and a cognitive defusion technique in managing obsessional intrusive thoughts***

***Project No: 2012076***

The College Ethics Committee has reviewed your application and has agreed that there is no objection on ethical grounds to the proposed study. They are happy therefore to approve the project, subject to the following conditions

- The research should be carried out only on the sites, and/or with the groups defined in the application.
- Any proposed changes in the protocol should be submitted for reassessment, except when it is necessary to change the protocol to eliminate hazard to the subjects or where the change involves only the administrative aspects of the project. The Ethics Committee should be informed of any such changes.
- If the study does not start within three years of the date of this letter, the project should be resubmitted.
- You should submit a short end of study report to the Ethics Committee within 3 months of completion.

Yours sincerely

Dr Dorothy McKeegan  
College Ethics Officer

Dr Dorothy McKeegan

Senior Lecturer

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## Appendix 2.2: Email advertisement for Recruitment Purposes

### **Would you like to take part in a research study about repetitive unwanted and unpleasant thoughts?**

**We can all experience these types of thoughts, especially when under stress, for example during exams times.**

This study is interested in finding out how people cope with these thoughts in a student population to help develop our understanding and treatment of mental health problems. I am looking for people who experience **any type of unwanted thoughts**. It doesn't matter what these thoughts are about, as there is a wide variety but here are some common examples:

- o thoughts that you left an appliance on that might cause a fire
- o image of a loved one having an accident
- o the thought that objects are not arranged perfectly
- o a thought or image that is contrary to your religious or moral beliefs
- o an impulse to say something rude or embarrassing
- o the thought of running your car off the road or into oncoming traffic
- o the thought that you didn't lock the door and someone may break in

Don't worry if you are not sure whether you are suitable. The first part of the study involves filling out a short questionnaire to help us decide whether you are eligible to participate. After completing the questionnaire and if you meet our entry criteria, we will invite you to participate in the second part of the study which involves two short meetings with our researcher, one week apart and will involve monitoring your thoughts in between these meetings. If you decide to take part, you are free to withdraw from the study at any time.

**If you are interested, please click on this link:**

<https://www.surveymonkey.com/s/VK32FYG>

**to fill out a 5 minute questionnaire and to find out further information on the study.**

Thank you in advance for any help you can provide with this research study. I am a postgraduate student and your input will help towards completion of my doctoral qualification and will provide much needed information to advance psychological treatments.

Bernadette O' Sullivan (BA, HDip Psych, MA, PhD)  
Trainee Clinical Psychologist  
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*Research supervised by Professor Kate Davidson*

## Appendix 2.3 Participant Information Sheet



### Participant Information Sheet

#### **Study Title: An Investigation into Ways of Managing Unwanted Intrusive Thoughts**

You are being invited to take part in a research study. Before deciding whether you wish to participate, it is important to read the following information so that you understand why the research is being carried out and what your participation would involve. Please take the time to read the information carefully and consider whether you wish to take part.

#### **What is the study about?**

The study is about 'intrusive thoughts'. An 'intrusive thought' is the name given to unpleasant or unwanted thoughts or images that pop into your mind unexpectedly. Nearly everyone has intrusive thoughts. This study wants to find out more about different ways individuals can respond to these thoughts.

#### **Why have I been asked to take part?**

This study is looking at intrusive thoughts in a non-clinical population. It is hoped that this will improve our understanding of the experience of intrusive thoughts in clinical populations with Obsessive Compulsive Disorder. This may lead to ideas for both research and for improvements in clinical practice with people who seek help from mental health services because of their intrusive thoughts.

#### **Do I have to take part?**

Taking part in this study is entirely voluntary. If you do decide to take part, you will be asked to keep this information sheet and to sign a consent form. You will receive a copy of your signed consent form. If you decide to take part you are free to withdraw from the study at any time, without having to provide any explanation and without consequence. Any information collected from you would then be destroyed.

#### **What will happen if I decide to take part?**

There are 2 parts to this study.

**Stage 1:** You will be asked to fill out an electronic questionnaire about your intrusive thoughts through a link to the website [surveymonkey.com](https://www.surveymonkey.com). This questionnaire will take about 5-10 minutes to complete.

**Stage 2:** Participation in stage 2 will involve two short, individual sessions with the researcher at a time of your convenience. Meetings will take place at the Public Health Department, University of Glasgow Campus, 1 Lilybank Gardens. Each of these sessions will last approximately 30 minutes and there will be a period of one week between them. At the first session you will be asked to identify one of your intrusive thoughts and asked to provide some ratings about it. During the week

you will be asked to keep a record of how often you experienced your identified thought. This should take no more than a few minutes each day. In the second session, you will be asked to provide some more ratings about your chosen thought.

### **What are the possible disadvantages and risk of taking part?**

There are no known risks of taking part in a study of this sort. This type of study has been used by many researchers and is commonly completed with help from student volunteers. The study will take up a small amount of your time and you may find it slightly uncomfortable to monitor unwanted thoughts. However, we do not predict that that you will experience any harmful effects. If you do find any aspect of the study unpleasant then you should let the researcher know. Additionally, you can contact Dr Susan Ralston, Clinical Psychologist, Department of Clinical Psychology, Leverndale Hospital, G53 7TU, Tel: 0141 2116629. She can direct you to further sources of support, if necessary. It is stressed that your participation is voluntary and that you are free to withdraw at any time.

### **What are the possible benefits of taking part?**

There are no direct benefits for you. However, it is hoped that this research will generate ideas for future research and lead to improvement in treatments for intrusive thoughts in clinical populations.

### **Will my taking part in this study be kept confidential?**

Yes. All information will be kept strictly confidential in accordance with the Data Protection Act 1998. You will be identified by an ID number and any information about you will have your name and address removed so that you cannot be recognised from it. Your data will be stored securely in a locked filing cabinet. Electronic data will be stored on an encrypted password-protected laptop from the University of Glasgow. At the end of the study, this data will be transferred to a secure computer drive, accessed only by the researcher. Your online questionnaire will be stored confidentially in a password-protected surveymonkey account and then downloaded and stored as per electronic data. All data will be stored for a period of 10 years and then destroyed. Your GP may be informed if the researcher becomes concerned about your mental well-being (e.g. if it seemed you were suffering from severe depression). Every attempt would be made to discuss this course of action with you before contacting your GP.

### **What will happen to the results of this research study?**

The results will be submitted for examination as part of the requirement for the Doctorate in Clinical Psychology at the University of Glasgow and it is hoped that the study will be published in a scientific journal. Your identification will not be included in any publication. Participants will be provided with a summary of the research findings upon request from the researcher.

### **Who is organising and funding the research?**

Institute of Health and Wellbeing, College of Medical, Veterinary and Life Sciences, University of Glasgow

### **Who has approved the study?**

The study has been reviewed and approved by the Institute of Health and Wellbeing, College of Medical, Veterinary and Life Sciences, University of Glasgow and the University of Glasgow Research Ethics Committee.

### Contact for further information

If you wish to discuss any points covered in the information sheet or wish to ask any questions about the study, please do not hesitate to get in contact with **Bernadette O' Sullivan** or my supervisor at the contact details below:

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Trainee Clinical Psychologist

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**THANK YOU FOR READING THIS INFORMATION SHEET. PLEASE KEEP A COPY FOR REFERENCE.**

## Appendix 2.4 Consent Form



University  
of Glasgow

### Consent Form

***Project Title: An Investigation into Ways of Managing Unwanted Intrusive Thoughts***

**Check the three statements given below and give your name and date below.  
Please save a copy of your completed consent form**

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

**YES**

**NO**

2. I understand that my participation is voluntary and that I can withdraw at any time, without giving any reason, without my legal rights being affected.

**YES**

**NO**

3. I agree to take part in the above study.

**YES**

**NO**

**Name of Participant** ..... (Print)

..... (Sign)

**Date** .....

**Name of Researcher** ..... (Print)

..... (Sign)

**Date** .....

## Appendix 2.5: VAS Appraisals Questionnaire

### VISUAL ANALOGUE SCALES

**How unpleasant is this thought?**

not at all

extremely



**How guilty does this thought make you feel when it comes into your head?**

not at all

extremely



**When this thought comes into your head how much do you worry that you might act on it or that it might otherwise happen in real life?**

not at all

a great deal



**How difficult is it for you to eliminate this thought once it comes into your head?**

not at all

extremely



**How unacceptable is this thought?**

not at all

extremely



**How important is it that you control, or suppress, this thought?**

not at all

extremely

\_\_\_\_\_

**To what extent does having this thought signify harm/danger to yourself or others?**

No  
harm/danger

Extreme  
harm/danger

\_\_\_\_\_

**When you have this thought, how responsible do you feel for harm occurring to yourself or to others?**

not at all

wholly

\_\_\_\_\_

## Appendix 2.6: DAILY DIARY

### DAYS 1, 2, 5 & 6

Date: \_\_\_\_\_

- Tally counter score: \_\_\_\_\_
- Estimate the number of times that your chosen intrusive thought entered your mind during the day: \_\_\_\_\_

- How much time did you spend thinking about your chosen intrusive thought during the day?

no time at all

all the time

\_\_\_\_\_

- How much distress did your chosen intrusive thought cause you during the day?

none at all

a great deal

\_\_\_\_\_

- How believable was your chosen intrusive thought during the day?

not at all

extremely

\_\_\_\_\_



## DAYS 3 & 4

Date: \_\_\_\_\_

- Tally counter score: \_\_\_\_\_
- Estimate the number of times that your chosen intrusive thought entered your mind during the day: \_\_\_\_\_

- How much time did you spend thinking about your chosen intrusive thought during the day?

no time at all

all the time

\_\_\_\_\_

- How much distress did your chosen intrusive thought cause you during the day?

none at all

a great deal

\_\_\_\_\_

- How believable was your chosen intrusive thought during the day?

not at all

extremely

\_\_\_\_\_

- How much did you try to follow the instructions relating to your chosen intrusive thought during the day?

not at all

a great deal

\_\_\_\_\_

- How easy was it to follow the instructions relating to your chosen intrusive thought during the day?

not at all

extremely

\_\_\_\_\_

## **Appendix 2.7: Description of an Intrusive Thought\***

We are interested in your experiences with **unpleasant and unwanted thoughts or images or impulses that pop into your mind unexpectedly**. Nearly **everyone has such experiences**, but people vary in how frequently these occur and how distressing they are. Some examples of the many possible negative intrusions are given below:

- X      an impulse to do something shameful or terrible
- X      the idea or image of harming someone you don't want to hurt
- X      the idea that something terrible will occur because you were not careful enough
- X      an unwanted sexual urge or image
- X      the thought that you or someone else will become dirty or contaminated by a substance that  
         may cause harm
- X      the thought that you left an appliance on that might cause a fire
- X      an image of a loved one having an accident
- X      the thought that objects are not arranged perfectly
- X      a thought or image that is contrary to your religious or moral beliefs
- X      an impulse to say something rude or embarrassing
- X      the thought of running your car/bike off the road or into oncoming traffic
- X      the thought that you didn't lock the door and someone may break in

Please note that we are NOT talking about daydreams or pleasant fantasies. Nor are we interested in thoughts, impulses, or images that are simply excessive worries about real-life problems. Also, we are NOT talking about the sort of negative thoughts that accompany depression or low self-confidence. Rather, we ARE interested in thoughts, mental images, or impulses that pop into your mind and that you experience as intrusive and inappropriate.

\* Based on instructions from the Interpretation of Intrusions Inventory (III; Obsessive Compulsive Cognitions Working Group, 2005)

## **Appendix 2.8: Target Thought Monitoring Instructions**

### **INSTRUCTIONS FOR DAYS 1 AND 2**

“For the next 2 days please follow these instructions. It doesn’t matter whether your chosen thought comes to mind often or not. It might or it might not, it can do either. However, if your thought does come to mind, please record each time it happens on your tally counter. It is important that you continue with these instructions until you receive a further text message instruction”.

### **INSTRUCTIONS FOR DAYS 5 AND 6**

“For the next two days, please disregard your instructions for days 3 and 4 and just do exactly as you did on days 1 and 2. In other words, it does not matter whether your chosen thought comes to mind often or not. It might or it might not. However, if your thought does come to mind, record each time it happens on your tally counter. Please get in touch if you have any questions”.

## Appendix 2.9: Cognitive Defusion Experimental Instructions

These are your **INSTRUCTIONS FOR DAYS 3 AND 4**. I will be asking you to try an exercise that may seem a bit unusual. The rationale for this exercise is explained below. Please read this sheet carefully. Read it a couple of times to make sure you understand what you are being asked to do and why.

### Rationale

Our minds are constantly telling us stories. People have a tendency to believe the stories/thoughts their minds tell them without questioning them. Obviously, some thoughts are true; we call these *facts*. But many thoughts cannot really be called *facts*. They are more like *opinions*, *judgments*, or *predictions* that may not fit with how things actually are.

For this exercise, I would like you to focus not on whether your target thought is true or false, but on whether it is helpful. If you let it guide your behaviour, will that help you to create a richer, fuller, and more meaningful life? If you get caught up with your target thought, will it help you to be the person you want to be and do the things you want to do? What if you could learn a skill so that next time you have your target thought, you don't get all absorbed in it.

I'd like you to try something now. Silently repeat to yourself "I can't lift my arm". Say it over and over again in your head and as you're saying it, try to lift your arm up. You should find that you can lift your arm even though your mind says you can't. You may have hesitated though. We're so used to believing what our minds tell us, for a moment you may have actually believed it. However, you can now see that you have the ability to control your behaviour regardless of what your mind is doing.

### Instructions

Over the next 2 days, every time your target thought pops into your head, record this on your tally counter, just as before. Then your task is to use the technique described below.

**Whenever you have your target thought, silently repeat the thought in your head with this phrase in front of it, "I notice I am having the thought that ...". For example, "I notice I am having the thought that I left the cooker switched on".**

It is important that you do not record this repetition of your target thought on your tally counter. Only record instances when your target thought pops into your head unintentionally.

The purpose of this exercise is to help create some distance between you and your target thought and stop you becoming caught up with the content of your thought. Please use this technique with your target thought from now until you receive further instructions.

## **Appendix 2.10: Suppression Experimental Instructions**

You will find below your **INSTRUCTIONS FOR DAYS 3 AND 4**. Please read this sheet carefully. Read it a couple of times to make sure you understand what you are being asked to do and why.

### **Rationale**

It is often said that much of our distress is caused by our negative or worrying thoughts, such as negative thoughts about the past, self, and the future. According to this view, these thoughts can cause difficult feelings and some unhelpful behaviours.

Do you see this pattern? First, there is the distressing thought and then problematic feelings and/or behaviour. One way to prevent this pattern is to control your distressing thoughts. You could control them by trying hard not to have these thoughts or by pushing them out of your mind as soon as they occur. This can help make those thoughts go away for a while and give you a break from them.

For the next couple of minutes, please practise trying as hard as you can not to think of your target thought and if it comes to mind, try to get rid of it.

### **Instructions**

For the next 2 days, I want you to try as hard as possible not to think of your target thought. Anytime the thought does pop into your head, record this using your tally counter and then try as hard as you can to push it out of your mind and make it disappear. However, if it pops into your head again at any point, please record this on your tally counter and try to get rid of it once again. Please continue to follow these instructions until you hear from me again.

## **Appendix 2.11: Research Proposal**

### **Assessment: Major Research Project Draft Proposal**

**Title: Comparing the Effectiveness of Thought Suppression and a Cognitive Defusion Technique in managing Obsessional Intrusive Thoughts**

Clinical Psychology Trainee: Bernadette O' Sullivan (10052610)

University Supervisor: Professor Kate Davidson    Field Supervisor: Dr. Andrew McLean

Date of Submission: 16/04/12

Version: 2

Word count: 3039 words

## **Abstract**

### Background

Thought suppression has been implicated in the development and maintenance of Obsessive Compulsive Disorder (OCD). Based on Wegner et al.'s (1987) research, suppression is widely viewed to lead to a paradoxical increase in thought frequency. However, further research evidence has been inconsistent and its interpretation has been hindered by methodological limitations of studies.

Cognitive defusion offers a possible alternative method of managing intrusive thoughts. Although cognitive defusion strategies are frequently used within an Acceptance and Commitment Therapy (ACT) based clinical context, the empirical evidence to support their efficacy is relatively limited.

### Aims

To employ a naturalistic experimental design to compare the effects of suppression and a cognitive defusion technique on thought frequency and distress in a non-clinical, highly obsessional cohort.

### Methods

A cohort of 60 “obsessive” students from Glasgow University will be asked to monitor their intrusive thoughts for an initial two days. They will be asked to suppress these thoughts or employ a cognitive defusion technique for the following two days. On the final two days, they will be asked to return to just monitoring their thoughts.

### Applications

The proposed study will have theoretical and research applications and could have clinical applications for both traditional cognitive-behavioural and ACT-based interventions for OCD.

## **Introduction**

Unwanted intrusive thoughts emerge as symptoms across a range of disorders, from OCD to generalised anxiety disorder, and depression, etc. (Clark, 2005). The focus in this study will be on intrusive thoughts in OCD. Leading cognitive behavioural therapy (CBT) models of OCD implicate suppression (i.e. trying not to think about something) as key in the development and maintenance of this disorder. For example, Salkovskis argues that thoughts give rise to active resistance when they activate overvalued beliefs that thoughts can cause harm, and that the individual is bound to prevent harm, even if his/her responsibility for harm is minute and uncertain (Salkovskis, 1985; 1989; 1998, Salkovskis et al., 1995; 2000). Thus, individuals must control thoughts that signify potential harm in order to prevent harm and the aversive sense that they may otherwise become responsible for harm. Furthermore, Rachman proposes that active resistance arises from beliefs that a thought about an action that is immoral is equivalent morally to actually performing that action (moral thought-action fusion) and that having thoughts about an event increases the likelihood of that event happening (likelihood thought-action fusion) (Rachman, 1997; 1998, Rachman & Hodgson, 1980). The individual attempts to control the thought because it offends her/his moral sensibilities both by its occurrence and because it may increase the likelihood of morally objectionable events occurring.

However, suppression is commonly believed to lead to a paradoxical increase in thought frequency since Wegner et al.'s (1987) classic "white bear" studies. In these studies, participants were randomly assigned to one of two groups, each completing two five minute conditions in counterbalanced order: 1) trying not to think of a white bear (suppression); 2) trying to think of a white bear (expression). It was found that during suppression, participants were unable to suppress white bear thoughts fully. Furthermore, thought occurrences were more frequent in the expression period following initial suppression than in the initial expression period. Therefore, it was suggested that suppression produced what has been called the "rebound effect". Further research demonstrated an increase in thought frequency during the act of suppression (e.g. Lavy & van den Hout, 1990), known as the "immediate enhancement effect".

Research evidence in this area has, however, been inconsistent. The authors of a systematic review of the effects of thought suppression on OCD (McLean & Broomfield, unpublished) concluded that there was no firm experimental evidence that suppression of OCD-type intrusions led to a rebound effect and limited support for an immediate enhancement effect. Furthermore, the interpretation of findings in this area has been hampered by methodological limitations of some of the studies to date. Key limitations identified in reviews by Purdon (2004), McLean & Broomfield (unpublished), and Abramowitz, Tolin, & Street (2001) include a lack of studies in clinical populations, studies that have used emotionally neutral thoughts, a reliance on lab-based experimental sessions, and lack of appropriate control conditions.

Cognitive defusion offers a possible alternative method of managing intrusive thoughts. It is a core element of ACT. In ACT, clients are encouraged to make willing contact with aversive psychological content. Cognitive defusion techniques are often employed in ACT interventions to achieve this. ACT explicitly states that the modification of problematic private events in function, and not in form or frequency, is the aim of treatment (Hayes, Strosahl, & Wilson, 1999). From an ACT perspective, clients are frequently fused with painful or negatively evaluated psychological content and defusion strategies create a defused perspective that allows greater behavioural flexibility.

Titchener's (1916) rapid word-repetition technique is perhaps the most well-known method for facilitating defusion. Within ACT, clients might be encouraged to repeat negative words rapidly (e.g. "stupid, stupid, stupid"). The therapeutic aim of this strategy is that, during the repetition task, the semantic functions (i.e. meaning) of the word will be significantly reduced. Clients have reported that towards the end of the exercise they experienced the words simply as a strange sound (Hayes, et al., 1999). The therapist then uses this experience to highlight that the client's negative thought content is purely verbal and not a reflection of reality.

Although cognitive defusion strategies are frequently used within an ACT-based clinical context, the empirical evidence to support their efficacy is relatively limited (Healy et al., 2008). A study with a non-clinical sample showed the relative effectiveness of an acceptance-based technique as compared to suppression in reducing distress but not frequency of intrusive thoughts (Marcks and Woods, 2005). The acceptance-based



technique consisted of asking participants to imagine their unwanted intrusive thoughts coming out their ears on little signs held by marching soldiers. They were then asked to just watch the soldiers march by in front of them like a little parade and not to argue with, avoid, or make the signs go away. Najmi et al. (2009) confirmed these findings in a clinical sample of OCD clients using the same acceptance technique. They showed that distress after suppression increased significantly, whereas distress after acceptance decreased significantly. Watson, Burley, and Purdon (2010) examined the effects of the cognitive defusion strategy of verbal repetition on reappraisal of contamination-related thoughts, typical of those experienced by individuals with OCD. They compared verbal repetition to brief imaginal exposure and no intervention (control). In the verbal repetition condition, participants were asked to engage in 30 seconds of repeating contamination words (e.g. disease, germs) loudly and as fast as possible. Those in the imaginal exposure condition were asked to imagine scenes involving contamination words for 30 seconds. Participants in the control condition were requested to sit quietly. Following the intervention, participants in the verbal repetition and imaginal exposure groups were asked to practice their intervention over the next week. Results showed that verbal repetition was associated with a greater decrease in negative appraisal ratings (believability, meaningfulness, distress) at post-intervention and at follow-up (1 week later) than was imaginal exposure or no intervention. One limitation of these ACT-based studies is that they were lab-based experiments (apart from the follow-up period in Watson, Burley, and Purdon (2010) and therefore lacking in ecological validity.

## **Rationale**

The current study will compare the effectiveness of suppression and a cognitive defusion technique in the naturalistic setting of participants' day-to-day environment over a period of six days. It should improve on methodological limitations in the current literature by use of a longer experimental period, conducted in the participant's natural environment, an analogue sample of participants who rate highly on a measure of obsessionality, personally relevant intrusive thoughts, and a baseline monitoring period.

## **Aims and hypotheses**

### **Aims**

To employ a naturalistic experimental design to compare the effects of thought suppression and a cognitive defusion technique on thought frequency and distress in a non-clinical, highly obsessional cohort.

### **Hypotheses**

The instruction to suppress intrusive thoughts will:

- increase intrusive thought frequency during suppression and in the subsequent monitoring phase relative to baseline. That is, immediate enhancement and rebound effects are predicted.
- Increase distress during suppression and in the subsequent monitoring phase relative to baseline.

The instruction to defuse from intrusive thoughts will:

- not result in any change in intrusive thought frequency.
- decrease distress during the defusion phase relative to baseline.

## **Plan of Investigation**

### **Participants**

Students at Glasgow University will be sent an email invitation asking if they experience intrusive thoughts and whether they would like to participate in a study about such thoughts. They will be provided with a link to an electronic screening instrument (Obsessions Subscale of the Clark-Beck Obsessive Compulsive Inventory) and a participant information sheet. Only individuals scoring  $\geq 12$  on the obsessions subscale (= 1 SD below the clinical mean) will be included in the study. It was decided to recruit students to this study because of their accessibility to the researcher. Furthermore, there is evidence that non-clinical individuals with high scores on self-report measures of OCD symptoms are a suitable group for studying OCD (Burns et al., 1995). Individuals receiving psychiatric or psychological treatment or scoring within the severe range on the HADS will be excluded from the study.

### **Measures**

Obsessions Subscale of the Clark Beck Obsessive Compulsive Inventory (Clark & Beck, 2002)

Hospital Anxiety and Depression Scale (Zigmond and Snaith, 1983)

Thought Control Questionnaire (Wells & Davies, 1994)

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

Frequency of intrusive thoughts will be measured by a hand-held golf tally counter, which has been applied in similar studies (e.g. McLean & Broomfield, 2007; Marks & Woods, 2005).

Levels of distress and appraisals of intrusions (e.g. unacceptability, believability of the thought) will be measured using Visual Analogue Scales (VAS). Appraisal items will be based on questions from Part II of the Revised Obsessional Intrusions Inventory (ROII, Purdon & Clark, 1994).

A Daily Diary will be provided to participants to record thought frequency and VAS ratings of distress associated with intrusive thoughts, acceptability and believability of intrusions, and effort and perceived success of suppression and cognitive defusion.

### **Design**

The study will have an experimental 2 (group) x 3 (phase) mixed model design. Participants will be randomly assigned using a computerised random number generation procedure to a suppression or defusion condition. Participants will be asked to monitor their intrusive thoughts for an initial two days (baseline monitoring phase). They will be asked to suppress these thoughts or employ a defusion technique for the following two days. On the final two days, they will be asked to return to just monitoring their thoughts. The baseline monitoring periods will allow participants act as their own controls. The

dependent variables will be intrusion frequency, associated distress, and appraisals of intrusions. The primary dependent variable will be thought frequency.

### Research Procedures

The study will be conducted over a one week period and the researcher will meet with participants on a one-to-one basis at the start and end of this period. At the pre-experimental meeting, participants will provide demographic data and complete baseline measurements for the HADS and AAQ-II. A personally relevant intrusive thought experienced within the past week will be identified and participants will be asked to complete a VAS questionnaire assessing their appraisals and distress associated with this thought.

See Appendices II and III for a description of how instructions will be provided to participants for thought monitoring, suppression, and cognitive defusion over the following six days.

At the post-experimental meeting, participants will be asked to complete the same VAS questionnaire as at the pre-experimental meeting. Compliance with experimental instructions will be measured qualitatively by asking participants how they suppressed or cognitively defused from their thoughts. A random subsample of these descriptions will be analysed by two different investigators and rated for compliance with instructions. Finally, participants will be asked to complete the Thought Control Questionnaire as it related to strategies employed on days three and four of the experiment.

### Data Analysis

Raw data will be anonymised and analysed using PASW Statistics 18. Data will be tested for normality and homogeneity of variance. Where appropriate, transformations will be employed. Independent *t*-tests for continuous data and Chi-squared tests for categorical data will be used to examine differences between groups. Mann-Whitney *U* tests will be used for non-parametric data. Correlational analyses will be used to investigate associations between variables. To examine the main hypotheses, each dependent variable will be analysed using a mixed 2 x 3 repeated measures ANOVA.

### Justification of sample size

Power calculations using G-POWER (Erdfelder, Faul, & Buchner, 1996) were completed to determine the required sample size based on the primary hypothesis. This hypothesis predicts a significant effect of experimental group (suppression, defusion) on thought frequency over six time points using a repeated measures analysis of variance (ANOVA). Methodology employed in previous research was not sufficiently comparable to estimate effect sizes for the current study. Therefore, Cohen's effect size (*f*) conventions for ANOVA (Cohen, 1977, 1988) were used with values of 0.1, 0.25, and 0.4 corresponding to small, medium, and large effect sizes, respectively. The following assumptions were made,  $\rho$  was conservatively predicted to be 0.3, correlations between all possible pairs of repeated measures would be identical (as assumed with repeated measures ANOVA) and significance level was taken as 0.05. Results indicated that for "medium" effect sizes, a total sample size of 40 would have adequate power ( $>0.80$ ). Therefore, the researcher will

aim to have 30 participants in each group to allow for participants dropping out of the study early or not completing measures.

### **Ethical Issues**

Ethical approval will be sought from the University of Glasgow Ethics Committee. The standard boundaries for confidentiality will apply and therefore should risk arise (e.g. participant discloses suicidal ideation or thoughts of self-harm) during the study, participants' GP will be informed. Any contact with GPs will be discussed with the participant beforehand whenever possible and the participant information sheet will outline this procedure for potential participants.

See Appendices IV and V for a description of health and safety issues and research equipment and expenses.

### **Timetable**

Outline – 12<sup>th</sup> December 2011

Draft Proposal – 31<sup>st</sup> January 2012

MRP Final Proposal – 16<sup>th</sup> April 2012

Ethics application to be submitted – July 2012

Ethics approval to be obtained by September 2012

Recruitment/Data collection to commence – September/October 2012

Draft thesis – June 2013

Submission – July 2013

### **Practical Applications**

It is hoped that knowledge provided by the current study may lead to clinical implications relevant to both traditional CBT and ACT-based interventions for OCD.

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## **Appendix I:**

### **Lay Summary**

#### **Study Aims**

The aims of this study are to find out what happens when people are told to “suppress” or “defuse” from their thoughts. Suppressing thoughts means asking people not to think about something. Defusion involves allowing people to step back from and watch their thoughts come and go instead of getting caught up in them. This study is interested in a particular type of thought experienced in Obsessive Compulsive Disorder (OCD) called an obsession. This is an unpleasant and unwanted intrusive thought that pops into your mind unexpectedly.

#### **What the Study Involves**

Students of the University of Glasgow, who are experiencing intrusive thoughts, will be asked to participate. They will be randomly split into two groups: (1) suppression and (2) defusion. Participants will be asked to record the frequency of their intrusive thoughts over one week. They will also provide ratings about their distress levels and views associated with these intrusive thoughts. On days three and four, participants in the suppression group will be asked to try as hard as possible not to think about their intrusive thought. Those in the defusion group will be taught a simple strategy to help prevent them getting caught up with their intrusive thought.

#### **Practical Implications**

It is hoped that the results may lead to improvements in treatments offered to those with OCD.

## **Appendix II: Experimental Instructions**

### **Thought Monitoring Instructions**

At the pre-experimental meeting, participants will be given instructions to record their chosen thought over the following six days by clicking a golf tally, which they will be asked to keep with them at all times. They will be given a diary to record daily intrusive thought frequency and appraisals. They will also be provided with two envelopes with further instructions to open on days three and five and given a text reminder on these days to open the appropriate envelope.

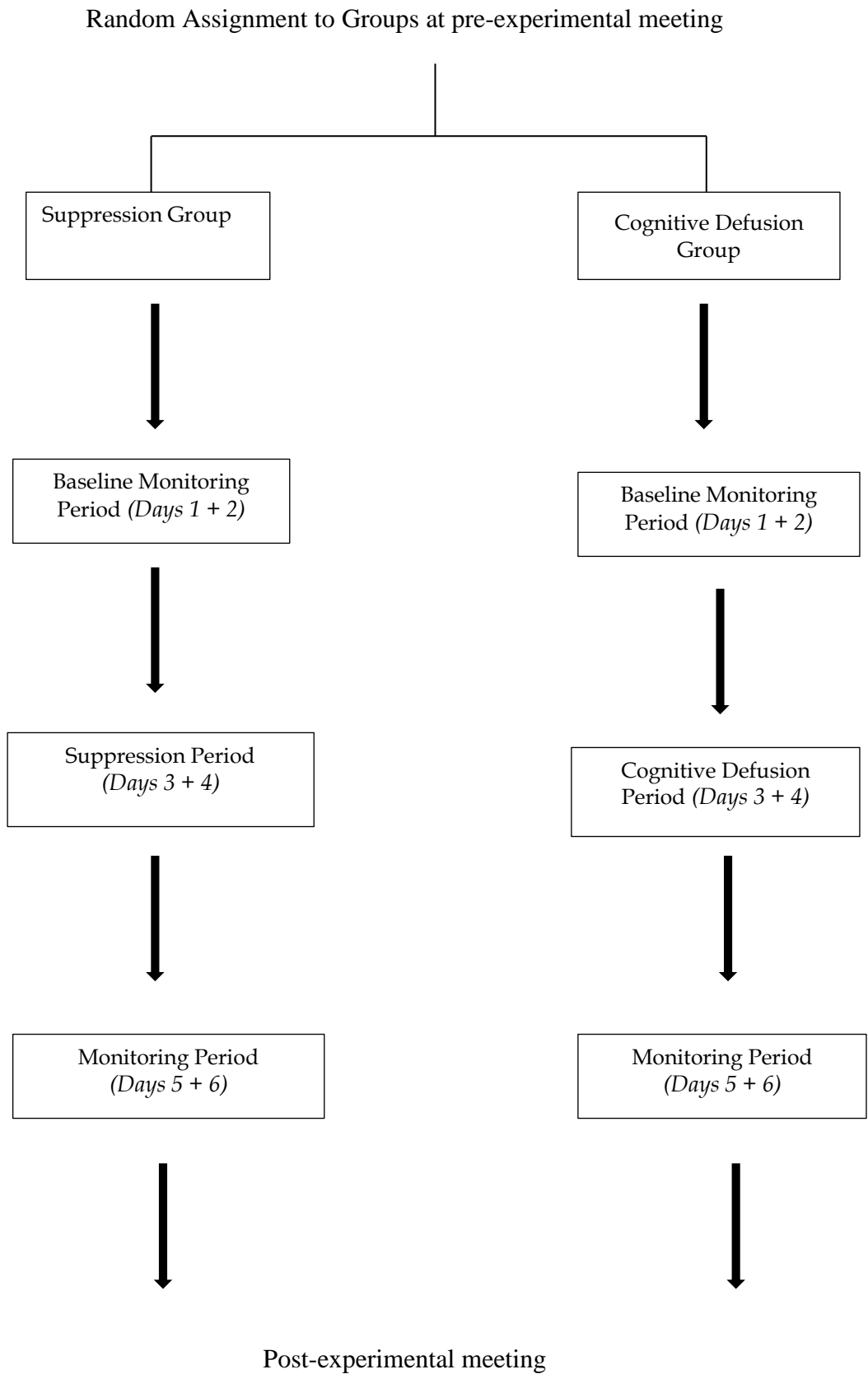
### **Suppression and Cognitive Defusion Groups**

Over days three and four, those in the suppression group will be instructed to try as hard as they can not to allow their chosen thought into their mind. However, if the thought does come to mind, they should record this on their tally counter. The instructions will include a rationale for using thought suppression. Those in the cognitive defusion group will be asked to employ a simple cognitive defusion strategy (outlined in the instructions) to help them detach from their chosen thought, should it occur. Similar to the suppression group, they will be requested to record these thought occurrences. Again, the instructions will include a rationale for cognitive defusion adapted from the ACT manual (Hayes et al., 1999).

On days five and six, all participants will be instructed to return to simply monitoring their chosen thought in the same way as on days one and two.



### Appendix III: Flowchart of Study Schedule



**Appendix IV:**  
**WEST OF SCOTLAND/ UNIVERSITY OF GLASGOW**  
**DOCTORATE IN CLINICAL PSYCHOLOGY**

**HEALTH AND SAFETY FOR RESEARCHERS**

1. Title of Project	Comparing the Effectiveness of Thought Suppression and a Cognitive Defusion Technique in managing Obsessional Intrusive Thoughts.
2. Trainee	Bernadette O' Sullivan
3. University Supervisor	Professor Kate Davidson
4. Other Supervisor(s)	Dr. Andrew McLean
5. Local Lead Clinician	
6. Participants: (age, group or sub-group, pre- or post-treatment, etc)	Students of the University of Glasgow
7. Procedures to be applied (eg, questionnaire, interview, etc)	Participants will be required to record the occurrence of an intrusive thought and complete questionnaires and visual analogue scales to measure their distress levels and appraisals of these thoughts.
8. Setting (where will procedures be carried out?)  i) General	The study will be conducted over the period of a week within participants' own natural environments. In other words, participants will be asked to follow study instructions as they go about their day-to-day lives over this period. They will also be invited to attend two one-to-one meetings with the researcher on the University campus at the beginning and end of the research period. The researcher will not meet with participants during the study period other than on these two occasions.
ii) Are home visits involved	Y/ <u>N</u>

**WEST OF SCOTLAND/ UNIVERSITY OF GLASGOW  
DOCTORATE IN CLINICAL PSYCHOLOGY**

**HEALTH AND SAFETY FOR RESEARCHERS**

<p>9. Potential Risk Factors Identified  (see chart)</p>	<p>Participants will be asked to monitor their intrusive thoughts. It is expected that this may cause some discomfort for a short time. This possibility will be explained to participants in the information sheet provided.</p>
<p>10. Actions to minimise risk (refer to 9)</p>	<p>Individuals receiving current psychiatric or psychological treatment will be excluded from participating in the study. Those scoring within the severe range on the Hospital Anxiety and Depression Scale will also be excluded.</p> <p>The standard boundaries for confidentiality will apply and therefore should risk issues (e.g. disclosure of suicidal ideation) arise during the study, participants' GPs will be informed. Any contact with GPs will be discussed with participants beforehand whenever possible. This will be explained to potential participants in the participant information sheet.</p> <p>Meetings with participants will be held on the University campus (within the Public Health Department, 1 Lilybank Gardens, University of Glasgow) within staffed areas, and will occur during standard working hours (i.e. 9am to 5pm).</p> <p>This study methodology has been used previously by a Clinical Psychology Trainee, with no serious adverse effects reported (Ralston, 2011)</p>

Trainee signature: ..... Date: .....

University supervisor signature:..... Date:.....

**WEST OF SCOTLAND/ UNIVERSITY OF GLASGOW  
DOCTORATE IN CLINICAL PSYCHOLOGY**

**HEALTH AND SAFETY FOR RESEARCHERS**

Points to consider when assessing risk. If any answer is “no” then make a case for the design being safe or reconsider the design of the study.

<b>Participants</b>	
<u><b>Yes</b></u>	<b>No</b>
This participant sample is not normally associated with dangerous or unpredictable behaviour	This participant sample is associated with impulsive, irrational or unpredictable behaviour, and/or has poor emotional control

<b>Procedures</b>	
<u><b>Yes</b></u>	<b>No</b>
The procedures in the study are same/similar to those used by clinical psychologists with these participants and are not normally associated with production of significant distress.	These are novel procedures, are not used with this group and by their nature might produce anger, irritability or distress.

<b>Settings</b>	
<u><b>Yes</b></u>	<b>No</b>
These are clinical or University research settings, or other institutional settings, that participants routinely attend (eg, a school). They have procedures in place to minimise risk to staff and these are thought to be adequate in the context of the proposed study.	A private or other setting where there are not health and safety procedures that are relevant to research or clinical work proceeding without risk

Version 3/10/06

## Appendix V:

### RESEARCH EQUIPMENT, CONSUMABLES AND EXPENSES

**Trainee** ...Bernadette O' Sullivan.....

**Year of Course** ...2nd.....

**Intake Year**...2010.....

Please complete the list below to the best of your ability:

Item	Details and Amount Required	Cost or Specify if to Request to Borrow from Department
Stationary	180 A5 envelopes	£2.60
Postage		
Photocopying and Laser Printing (includes cost of white paper)	Daily diaries x 420 VAS scales (2 pages) pre- and post-experiment Consent forms x 120 Experimental instructions x360 Photocopying 60 HADS and 60 Thought Control Questionnaires (2 pages) and 60AAQ-II	£33.60 £19.20 £9.60 £28.80 £4.80 £9.60 £4.80
Equipment and Software	Mobile phone SIM card Phone usage	£10 £30
Measures	Clark-Beck Obsessive Compulsive Inventory (CBOCI). 3 packs of 25 record forms.	£139.50
Miscellaneous	Survey Monkey costs £24 per month x 7	£168

Trainee Signature.....

Date.....

Supervisor's Signature .....

Date .....