An Exploration of Heart Rate Variability Reactivity in Response to Compassion Focused Therapy for People with Eating Disorders: A Feasibility Study

Thesis submitted in part fulfillment of the degree of

Doctorate in Clinical Psychology
(DClinPsy)
University of Leicester

by

Megan Simmonds
Department of Clinical Psychology
University of Leicester

April 2015
Declaration

I can confirm that this thesis and the research reported within it is my original work. It was written and submitted in part fulfillment of the degree of Doctorate in Clinical Psychology (DClinPsy). It has not been submitted for any other degree or academic qualification.
An Exploration of Heart Rate Variability Reactivity in Response to Compassion Focused Therapy for People with Eating Disorders: A Feasibility Study

Megan Simmonds

Thesis Abstract

Literature Review

The literature review aimed to explore the treatment outcomes associated with compassion focused therapies. Systematic searches were used to identify studies evaluating compassion focused therapies. Based on the synthesis of eleven empirical papers, compassion focused therapies were found to be associated with increases in self-reassurance and self-esteem, along with decreases in shame, depression, and anxiety. In contrast, the findings suggest that self-criticism is a quality resistant to treatment. More rigorous research is needed to establish the efficacy of compassion focused therapies, and to better understand the mechanisms of change associated with compassion-based approaches.

Empirical Paper

The empirical paper was a small-scale feasibility study designed to investigate the effects of compassionate imagery on measures of soothing. Service users from a compassion focused therapy group for eating disorders completed a compassionate imagery task whilst measures were taken of their heart rate variability, social safeness and self-reported soothing. Measures of acceptability and feasibility were also included in the study. Quantitative analyses revealed that practising compassion was generally associated with positive changes in the soothing measures, although these changes were only observed at the end of therapy. Exploring individual differences in the data revealed that not all participants shifted to a soothing response during therapy, and changes in soothing did not always parallel changes in the treatment outcomes. The acceptability and feasibility of the study was confirmed through participation rates and qualitative feedback from a focus group. Extending the research to further explore how changes in compassion, soothing and psychopathology relate to one another was recommended.

Critical Appraisal

The critical appraisal provides a reflective account of the research process.
Acknowledgements

I would like to thank the service users who volunteered to take part in this research. Their participation was greatly appreciated and without them this research would not have been possible.

I would also like to thank my research supervisors, Dr Steve Allan and Dr Ken Goss. From the beginning of the project until the very end your support and guidance was invaluable. I also could not have done this research without the other clinicians at the eating disorder service who facilitated recruitment from the therapy groups and helped to collect the routine data. The team always made me feel welcome and I was grateful for that.

To my cohort I extend the greatest thanks. They managed to get me through in one piece and have shared this rollercoaster ride with me.

Finally I would like to thank my family and friends, particularly my husband. Your support has been immeasurable and I couldn’t have done it without you by my side.
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Literature Review

What does compassion have to offer? A systematic review of the treatment outcomes associated with compassion focused therapies
Abstract

Objective: Models and theories of compassion are becoming increasingly popular, however the empirical evidence evaluating the effectiveness of compassion focused therapies is relatively sparse (see Barnard & Curry, 2011, Leaviss & Uttley, 2015, and MacBeth & Gumley, 2012). The current review aimed to assess the treatment outcomes associated with compassion focused therapies.

Method: Systematic searches were used to identify empirical studies evaluating the effectiveness of interventions that explicitly aimed to enhance compassion in clinical populations. Four electronic databases were searched (PsychINFO, Medline, Web of Science, and Scopus) and the resulting articles were assessed for their quality. In total eleven relevant peer-reviewed journal articles met the criteria for inclusion in the current review.

Results: A synthesis of the key findings revealed that compassion focused therapies are often associated with increases in self-reassurance and self-esteem, along with decreases in shame, depression, and anxiety. Despite their focus, self-compassion does not always significantly increase following compassion focused therapies, and self-criticism is a quality that seems to be resistant to treatment.

Conclusions: The findings indicated that compassion focused therapies provide a transdiagnostic approach for treating symptoms that correspond to a wide range of mental health disorders (Gilbert, 2005, 2010a, 2010b). Although the findings were favourable, the conclusions of the current review are limited by a dearth of randomised control trials evaluating compassion focused therapies. In addition to this, further research is needed to identify the distinct mechanisms of change associated with compassion focused therapies.
1. Introduction

Over the last twenty years, Gilbert (2005, 2010a, 2010b) has developed an influential theory that conceptualises compassion as stemming from a neurophysiological motivational system designed to regulate negative affect through feelings of safeness, warmth, and care. Due to its roots in neuroscience and evolutionary psychology, Gilbert’s (2005, 2010b) theory of compassion can be distinguished from Neff’s (2003) conceptualisation, which has a greater emphasis on Buddhist traditions and how the attributes of kindness and self-compassion can influence general well-being. One of the central tenets of Gilbert’s (2005) theory is that low levels of self-compassion are often found in people experiencing clinical levels of distress. Gilbert (2010b) proposes that developing a compassionate stance towards one’s self and others can help individuals to engage with difficult emotions in a way that helps to reduce the experience of their distress. As a result, compassion is becoming increasingly incorporated into psychological therapies as an important therapeutic focus and goal (Gilbert, 2010b).

Compassion focused therapies rely on the premise that compassion is a trait that can be nurtured and enhanced, and that increasing one’s ability to be compassionate will have beneficial effects on distress and well-being (Gilbert, 2010b; Neff & Germer, 2013). Unlike other therapeutic approaches, compassion focused therapies are defined by their orientation rather than a single manualised therapy (Gilbert, 2010b). They utilise skills and techniques that are designed to increase feelings of self-compassion and self-soothing to target feelings of shame and self-criticism, emotions that are thought to underpin a wide range of mental health difficulties (Gilbert & Irons, 2005). It is hypothesised that increasing one’s level of self-compassion can lead to reductions in symptoms of psychopathology including depression (Gilbert & Irons, 2004), anxiety (Welford, 2010), and low self-esteem (Neff & Vonk, 2009).

1.1. Reviews of Compassion and Psychopathology

Two reviews have previously explored the relationship between compassion and psychopathology (Barnard & Curry, 2011; MacBeth & Gumley,
Barnard and Curry (2011) carried out a comprehensive narrative review evaluating three aspects of self-compassion: the construct of self-compassion, the correlates of self-compassion, and interventions that enhance self-compassion. In relation to the correlates of self-compassion, Barnard and Curry (2011) summarised the data from ten studies reported in eight papers: four studies measured both anxiety and depression symptoms, five measured only depression symptoms, and one measured only anxiety symptoms. For the five anxiety studies, significant negative correlations were reported between anxiety and self-compassion ranging from $r = -.21$ to $r = -.75$. In addition to this, the nine depression studies also reported significant negative correlations between depression symptoms and self-compassion ranging from $r = -.21$ to $r = -.54$. Consequently, Barnard and Curry concluded that lower levels of self-compassion are associated with higher levels of anxiety and depression.

A more recent meta-analysis conducted by MacBeth and Gumley (2012) reviewed 14 published articles that summarised the findings from 20 studies exploring the relationship between compassion and psychopathology. It is noted that half of the studies were also in the Barnard and Curry (2011) review. Consistent with Barnard and Curry’s findings, MacBeth and Gumley’s meta-analysis indicated that lower levels of self-compassion were associated with higher levels of anxiety and depression symptoms, and these relationships were reported to be representative of large effect sizes (anxiety mean $r = -.51$ and depression mean $r = -.52$).

Although both reviews support the hypothesis that self-compassion is significantly related to symptoms of anxiety and depression, the findings were subject to several limitations. Firstly, the evidence cited in both reviews was mostly from cross-sectional studies, meaning that the direction of the relationship between compassion and psychopathology could not be assessed. In addition to this, the majority of the studies cited relied on data from subclinical student or community samples, which limits the generalisability of the findings. Consequently it is not yet understood how self-compassion relates to psychopathology in clinical samples. Finally, most of the studies across the reviews also utilised Neff’s (2003) Self-Compassion Scale to measure self-compassion. Although the Self-Compassion Scale appears to be a robust and reliable measure of compassion, MacBeth and
Gumley (2012) acknowledged that the reviews were limited by the ubiquity of the Self-Compassion Scale as a valid index of compassion.

### 1.2. Reviews of the Psychotherapeutic Benefits of Compassion

As well as exploring the relationship between compassion and psychopathology, Barnard and Curry’s (2011) review also collated theoretical and empirical evidence relating to interventions that supposedly enhance self-compassion. Their review included one-off induction studies, as well as therapeutic approaches that were not explicitly designed to increase self-compassion (e.g., mindfulness). The authors’ argument for including these approaches was that there might be common factors in psychotherapies that implicitly increase self-compassion. Barnard and Curry surmised that the existing evidence in support of interventions that enhance self-compassion is promising, however the evidence they presented was brief and their findings lacked synthesis.

In terms of compassion-based approaches, Barnard and Curry described the findings from two compassionate mind training studies (Gilbert & Procter, 2006; Mayhew & Gilbert, 2008) and one compassionate imagery study (Gilbert & Irons, 2004). Between them the studies reported improvements in relation to depression, anxiety, shame, psychoticism, paranoia, self-compassion, and self-criticism. Although positive findings were described, Barnard and Curry claimed that more rigorous evidence was needed before general conclusions could be made about the effectiveness of the interventions.

To address this gap, a systematic review of the psychotherapeutic benefits of compassion focused therapies was conducted by Leaviss and Uttley (2015). Fourteen papers evidencing the effectiveness of compassion focused therapies in both clinical and non-clinical samples were reviewed, and the findings suggest that compassion focused therapies are a promising form of intervention. The main limitation of Leaviss and Uttley’s review is how they organised their findings: The results were grouped by study design, and few details were given in relation to the treatment outcomes that were consistently associated with compassion focused therapies. Whilst the review indicated that several of the studies included in the review had reported improvements in relation to depression, anxiety, self-
criticism, and self-compassion, the review neglected to consider how the studies had measured the treatment outcomes. The authors also tended to overlook studies that had reported contradictory findings when summarising their results, indicating that some of the conclusions in the review were biased.

1.3. Rationale and Aims of the Current Review

As the evidence base for compassion focused therapies rapidly continues to develop, some of the limitations of the previous reviews can begin to be addressed. Previous reviews of compassion focused therapies have primarily focused on treatment protocols rather than treatment outcomes (as reported by Barnard & Curry, 2011, and Leaviss & Uttley, 2015). The current review extends the previous reviews by providing an in-depth overview of the treatment outcomes associated with compassion focused therapies. Since the publication of the previous reviews more studies have been published evaluating the effectiveness of compassion focused therapies with clinical populations. As a result it is possible for the current review to provide greater insight into the clinical treatment outcomes that have been found in relation to compassion focused therapies. The current review aims to provide an up-to-date synthesis of the evidence evaluating compassion focused treatment programmes with a particular focus on treatment outcomes. Specifically, the following question is addressed:

• What are the treatment outcomes associated with compassion focused therapy treatment programmes?

2. Method

2.1. Inclusion Criteria

Studies were eligible for inclusion in the current review if they evaluated a compassion focused therapy (to count as a therapeutic intervention training needed to occur more than once). Studies were also required to use validated or standardised treatment outcome measures (e.g., measures of psychopathology...
administered pre- and post-intervention). Due to the infancy of compassion focused therapies and the likely dearth of randomised controlled trials, the searches were not limited by study design.

Studies were excluded from the current review if they did not evaluate a compassion focused therapy (e.g., evaluated a mindfulness programme), reported a cross-sectional design (e.g., measures were only administered at one time point), did not use at least one validated or standardised measure (e.g., relied on informal diary measures), were not peer-reviewed journal articles, were published in a language other than English, and as compassion research is still in its infancy the searches were limited to articles published from 1994 onwards. To maximise the clinical relevance of the review, the search was also limited to studies with adult clinical populations.

2.2. Search Strategy

Four electronic databases were used to locate relevant studies: PsycINFO, MedLine, Web of Science, and Scopus. The searches were conducted from 1st September 2014 to 2nd October 2014. The search terms were based on the following concepts: compassion, therapies, and psychopathology. The selection of search terms was informed by a scoping review of the literature and keywords from relevant articles were included to maximise the breadth of the search. The searches targeted the titles, abstracts, and keywords of articles, as including the full texts in the search resulted in the retrieval of a high number of false positives. A summary of the search terms and database parameters can be found in Appendix A.

2.3. Study Selection

The electronic searches resulted in 1277 citations, including 356 duplicate articles that were subsequently removed. A flow diagram of the exclusion process is presented in Appendix B. The titles and abstracts of the 921 deduplicated articles were scrutinized for their eligibility, and 808 citations were excluded. The most common reasons for exclusion were for focusing on compassion fatigue or on
the treatment of physical health problems. The full papers of the shortlisted articles \((n = 113)\) were accessed to establish which studies were eligible for inclusion in the current review. The selection criteria excluded 102 of the articles: 30 were correlational studies, 21 used non-clinical samples, 19 were theoretical papers, 15 did not evaluate a compassion focused therapy, and a further 11 also failed to meet the inclusion criteria. The references of remaining 11 articles were hand-searched, which further identified one article \((n = 12)\).

2.4. Quality Assessment

The methodological quality of the resulting 12 articles was evaluated using the Crowe Critical Appraisal Tool (CCAT; Crowe, 2013). The CCAT is designed to address the shortcomings of reliability and validity inherent in many critical appraisal tools (Crowe & Sheppard, 2011). Each paper is rated in relation to eight categories: preliminaries, introduction, design, sampling, data collection, ethical matters, results, and discussion; with each rating ranging from 0-5 (with 5 being the highest score). An advantage of the CCAT is that it encourages reviewers to appraise the methodology of each article according to the research question being addressed, which avoids inappropriate comparisons being made between studies using different research designs. A copy of the CCAT can be found in Appendix C, and the individual scores for each article included in the current review are presented in Appendix D.

The quality of the articles considered for inclusion in the current review was generally high, with most articles scoring 4 or 5 in most of the domains assessed. As a result of the quality assessment, one article (Noorbala et al., 2013) was excluded from the current review because it scored poorly across all eight categories. Eleven articles were consequently included in the final review.

2.5. Data Synthesis and Appraisal

The main features of the shortlisted articles (population, intervention, comparison group, and outcomes [PICO]) are outlined in Appendix D. PICO was chosen as the data extraction framework because it is a useful method for
summarising clinically relevant findings (Richardson et al., 1995). The study selection process resulted in a heterogeneous sample of studies in terms of interventions, sample characteristics, and outcome measures. Due to the heterogeneity of the studies, a meta-analysis could not be conducted. The results of this review are a narrative description of the themes that emerged across the studies.

3. Results

Out of the eleven articles included in the current review, eight of them reported outcomes for group interventions: three for common mental health problems (Gilbert & Procter, 2006; Judge et al., 2012; Stewart & Holland, 2011); two with psychosis/schizophrenia samples (Braehler et al., 2013; Laithwaite et al., 2009); one with an eating disorder sample (Gale et al., 2014); one with an acquired brain injury (ABI) sample (Ashworth et al., 2014); and one with a personality disorder sample (Lucre & Corten, 2013). The three remaining articles reported outcomes of individual interventions: one with a trauma sample (Beaumont et al., 2012); one with a psychosis sample (Mayhew & Gilbert, 2008); and one ABI case study (Ashworth et al., 2011).

The results section is organised by the treatment outcomes that were commonly reported across the studies. The concepts that were frequently measured were self-compassion, self-reassurance and self-criticism, shame, self-esteem, social comparison and submissive behaviour, depression, and anxiety.

3.1. Self-Compassion

Three of the five studies that measured changes in self-compassion reported improvements post-intervention. Three studies measured changes in self-compassion using the Self-Compassion Scale (SCS; Neff, 2003). The SCS contains 26 items that assess the three components of self-compassion defined by Neff (2003): self-kindness, common humanity, and mindfulness. The three subscales are strongly correlated allowing a single higher-order factor of self-compassion to be calculated, which is the score most commonly reported.
The SCS was used by Stewart and Holland (2011) who reported descriptive increases in self-compassion following a compassionate mind training (CMT) group for individuals with mental health difficulties ($n = 4$), although no statistical significance was reported. In contrast to this, two studies using the SCS to evaluate the effects of compassion focused therapies for individuals who had experienced psychotic symptoms did not find any significant changes (Laithwaite et al., 2009; Mayhew & Gilbert, 2008). Beaumont et al. (2012) contrastingly used a short form of the SCS (Raes et al., 2011) and found greater increases in self-compassion for individuals who had experienced trauma randomised to receive cognitive behaviour therapy (CBT) coupled with group CMT ($n = 16$), as opposed to CBT alone ($n = 16$).

An alternative measure of compassion was used by Braehler et al. (2013). Braehler et al. conducted a feasibility randomised control trial (RCT) to compare group compassion focused therapy (CFT) plus treatment as usual ($n = 22$) with treatment as usual alone (TAU, $n = 18$) for people recovering from psychosis. Changes in compassion were measured by coding interview transcripts using the Narrative Recovery Style Scale (Gumley et al., 2010, as cited in Braehler et al., 2013). The findings reported by Braehler et al. revealed that the CFT participants demonstrated a larger increase of compassion in their narratives at the end of treatment compared to the TAU participants.

The findings indicate that compassion focused therapies do not necessarily result in increases in self-compassion, particularly in people with psychosis (Laithwaite et al., 2009; Mayhew & Gilbert, 2008). Although studies have reported finding increases in self-compassion following compassion focused therapies (Beaumont et al., 2012; Braehler et al., 2013; Stewart & Holland, 2011) the changes appear to be small and the clinical significance of the changes are undetermined.

### 3.2. Self-Reassurance and Self-Criticism

The ability to soothe and reassure oneself when faced with self-critical thoughts is an important skill directly associated with self-compassion (Gilbert et al., 2006). Six studies in the current review reported significant improvements in self-reassurance and self-criticism using the Forms of Self-Criticising/Attacking
and Self-Reassuring Scale (FSCRS; Gilbert et al., 2004). The FSCRS contains 22 items that comprise two measures of self-criticism (inadequate self and hated self) and one measure of self-reassurance (reassured self). Mayhew and Gilbert (2008) used the FSCRS in their case series exploring the effects of CMT adapted for people who hear malevolent voices (n = 3). All three participants exhibited reductions in their inadequate self scores, and two of the three participants reported that they heard more reassuring voices, whilst the third participant continued to experience a high level of reassuring voices.

Three studies used the FSCRS to evaluate the effects of group-based interventions for people with a range of common mental health problems (Gilbert & Procter, 2006; Judge et al., 2012; Stewart & Holland, 2011). In all three studies the FSCRS indicated that after the intervention participants were better able to reassure themselves (as indexed by increases in reassured self scores), and were somewhat less self-critical (as indexed by inadequate self and hated self scores). In Gilbert and Procter (2006) the participants also found that self-soothing thoughts after the intervention were ‘more powerful and accessible’ (p. 368).

Additional supporting evidence using the FSCRS was also reported by Ashworth et al. (2014). In the study by Ashworth et al. a sample of people with ABI (n = 12) received both group and individual sessions of CFT, and significant improvements were found on all of the FSCRS subscales at the end of treatment and at 3-month follow-up. Lucre and Corten (2013) on the other hand used the FSCRS to explore the effects of a group CFT programme for people with personality disorders (n = 8). Findings from this study demonstrated that whilst participants reported being less self-hating and more self-reassuring after the intervention, there was no significant change in inadequate self scores.

In contrast to the aforementioned studies, Gale et al. (2014) evaluated the impact of a group CFT programme for people with eating disorders (n = 99) using the Stirling Eating Disorders Scale (SEDS; Williams et al., 1994). The SEDS is a measure of eating disorder symptomatology, but also contains a nondietary scale measuring self-directed hostility. Gale et al. found that CFT was associated with significantly lower self-directed hostility, particularly in people with bulimia nervosa. Interestingly, changes in self-directed hostility were less apparent in the anorexia nervosa sample.
The findings consistently demonstrate that compassion focused therapies are associated with improvements in relation to self-reassurance, however it is noted that several studies included in the current review reported smaller changes in relation to self-criticism (Gilbert & Procter, 2006; Judge et al., 2012; Lucre & Corten, 2013).

3.3. Shame

Individuals who regularly experience feelings of shame are reported to be vulnerable to a range of psychological symptoms (Goss et al., 1994). Shame is an acutely negative emotion that has two forms: external shame and internal shame (Gilbert, 1998). External shame is characterised by feelings of worthlessness and powerlessness due to perceiving ‘others’ as judging the self negatively (Tangney & Tracy, 2012). In contrast to this, internal shame relates to negative self-focused feelings and judgements (Gilbert, 1998).

Five of the articles included in the current review included measures of shame. The most frequently cited measure was the Other As Shamer Scale (OAS; Allan et al., 1994; Goss et al., 1994), which is an 18-item measure of external shame. Gilbert and Procter (2006) and Judge et al. (2012) both found that their group-based compassion interventions for common mental health problems were associated with reductions in external shame. Judge et al. (2012) also found reductions on the shame subscale of the Internalized Shame Scale (Cook, 1994), a measure of negative self-evaluation. Lucre and Corten (2013) found that group CFT with a personality-disorder population \( n = 8 \) was associated with significant decreases in external shame that continued to improve at one-year follow-up. In contrast to this, Laithwaite et al. (2009) found that their Recovery After Psychosis programme for individuals diagnosed with schizophrenia \( n = 18 \) was only associated with a small and nonsignificant reduction in external shame.

Braehler et al. (2013) used an alternative index of shame with their psychosis sample. The scale used was the Personal Beliefs about Illness
Questionnaire–Revised (PBIQ-R1; Birchwood et al., 2012), which includes a four-item scale measuring shame. Braehler et al. reported that increases in compassion in the CFT with TAU group (n = 22) were significantly correlated with decreases in self-reported shame on the PBIQ-R.

Taken together the findings suggest that compassion focused therapies are associated with improvements in both external and internal shame.

3.4. Self-Esteem

Three of the studies in the current review evaluated changes in self-esteem. Self-esteem refers to judgements about one’s self worth, significance, and competence (Robson, 1989; Rosenberg, 1965). Ashworth et al. (2011) used the Self-Concept Questionnaire (SCQ; Robson, 1989) – a broad 30-item measure of how one sees the self – to evaluate the effects of CFT for an individual with an ABI. The individual in the case study demonstrated a significant improvement on the SCQ, with her scores reliably changing from ‘above the cut off’ to the ‘normal range’. Gale et al. (2014) also found significant increases in self-esteem following their group intervention for people with eating disorders (n = 99) using a subscale of the Stirling Eating Disorder Scale (SEDS; Williams et al., 1994). In contrast to some of their other findings, this effect was not dependent on the type of eating disorder diagnosis.

Whilst the effect of compassion focused interventions on self-esteem looks straightforward, it is worth noting that when more than one measure is used less consistent findings can arise. Laithwaite et al. (2009) used the SCQ, the Rosenberg Self-Esteem measure (RSE; Rosenberg, 1965), and the Self-Image Profile for Adults (SIP–AD; Butler & Gasson, 2004) to evaluate their Recovery After Psychosis programme (n = 18). The RSE is a 10-item measure that is considered to be a narrower measure than the SCQ, as it has a greater focus on the evaluative component of self worth. The SIP-AD on the other hand is a 30-item measure of the discrepancy between how a person sees themselves and how they wish to be. Laithwaite et al. found significant increases in RSE scores at the end of the group

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1 Braehler et al. (2013) reported using the PBIQ-R, but referenced the original PBIQ. The ‘shame’ index was only introduced in the revised version of the PBIQ suggesting that the reference cited by Braehler et al. is in incorrect.
and at six-week follow up, however changes on the SCQ and SIP–AD did not reach significance.

The findings suggest that compassion focused therapies are generally associated with improvements in self-esteem (Ashworth et al., 2011; Gale et al., 2014; Laithwaite et al., 2009), although the initial evidence highlights that this findings may depend on how self-esteem is defined and measured.

3.5. Social Comparison and Submissive Behaviour

Individuals with a tendency to compare themselves unfavourably with others often experience greater levels of psychopathology (Allan & Gilbert, 1995). Judgements about one’s relative rank and social standing are a target for compassion-based interventions, as such evaluations can underpin feelings of shame (Cheung et al., 2004; Gilbert, 2000). The evidence for improvements in social comparison and submissive behaviour was generally favourable. Three studies used the Social Comparison Scale (Allan & Gilbert, 1995) and the Submissive Behaviour Scale (SBS; Allan & Gilbert, 1997) to evaluate changes in social rank. Gilbert and Procter (2006) and Judge et al. (2012) both evaluated group interventions for people with common mental health problems and reported significant reductions in feelings of inferiority, as well as significant reductions in submissive behaviour. Lucre and Corten (2013) on the other hand evaluated group CFT for a personality disorder population (n = 8) and found that whilst feelings of social comparison significantly improved, there was only a small but non-significant change in submissive behaviour. In addition to the above, Laithwaite et al. (2009) also used the Social Comparison Scale to evaluate their Recovery After Psychosis programme (n = 18). Following the group participants reported significant improvements in social comparison, and this change was maintained at follow-up six weeks later.

Overall the findings indicate that compassion focused therapies are associated with improvements in feelings of inferiority (Gilbert & Procter, 2006; Judge et al., 2012; Laithwaite et al., 2009; Lucre & Corten, 2013), and there is also a trend for reductions in submissive behaviour (Gilbert & Procter, 2006; Judge et al., 2012; Laithwaite et al., 2009).
3.6. Depression

Depression was the most frequently measured outcome variable and most of the studies that measured depression reported using the Beck Depression Inventory – Second Edition (BDI–II; Beck et al., 1996). The BDI–II is a 21-item self-report measure of depression. Judge et al. (2012) used the BDI–II to evaluate a group CFT intervention for common mental health problems (n = 27). The intervention was associated with significant reductions in depression, and their findings suggest that individuals with higher depression scores at baseline demonstrated greater improvements across the course of the intervention. Braehler et al. (2013) also used the BDI–II to evaluate the effect of their group treatment for psychosis. The group receiving CFT as well as TAU (n = 22) demonstrated a significant decrease in depression, whilst the TAU group (n = 18) did not exhibit a significant change. Laithwaite et al. (2009) also used the BDI–II as well as the Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987) to evaluate their Recovery After Psychosis intervention (n = 18). The PANSS measures schizophrenic symptomatology and includes a single item that pertains to depression. Significant reductions were demonstrated on the BDI–II, however the PANSS depression item was not associated with any significant changes. It is possible that the single PANSS item was not sensitive enough to detect any changes in depression in comparison to the BDI–II. In conjunction with the studies mentioned above, Ashworth et al. (2011) also used the BDI–II in their ABI case study and reported a reliable change in the individual’s depression scores, with scores moving from the ‘severe’ to ‘moderate’ range.

The second most commonly used measure of depression was the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). The HADS is a 14-item scale that contains two subscales: one measuring depression symptoms and the other measuring anxiety symptoms. Ashworth et al. (2014) reported reductions in HADS depression scores in their ABI sample (n = 12), and these were maintained at 3-month follow-up. Gilbert and Procter (2006) also found that their CMT intervention was associated with significant decreases in depression in a sample of people with common mental health problems (n = 6). Further support was also reported by Beaumont et al. (2012) who compared CBT plus CMT for
trauma ($n = 16$) with CBT only ($n = 16$). Although both groups were found to exhibit significant reductions in depression on the HADS, the CBT plus CMT group demonstrated a larger reduction when compared to the CBT only group.

Results from a further three depression measures were also reported. Stewart and Holland (2011) used the Public Health Questionnaire (Kroenke et al., 2001) in their CMT group for common mental health problems ($n = 4$). The findings from this study revealed that three of the four individuals reported in the case series exhibited reductions in depression. Mayhew and Gilbert (2008) on the other hand used the Symptom Checklist 90 (SCL-90; Derogatis et al., 1976) to evaluate their CMT intervention for individuals with psychosis ($n = 3$). The SCL-90 contains a subscale measuring depression and all three individuals in the case series demonstrated reductions in their depression scores. Finally, Lucre and Corten (2013) used a short version of the Depression Anxiety Stress Scales (Antony et al., 1998). Their CFT group for personality disorders ($n = 8$) was associated with a significant reduction in depression, which was maintained at one-year follow-up.

All ten of the studies that measured depression reported positive findings (the only study to not measure depression was Gale et al., 2014). Reductions in depression were consistently reported regardless of clinical population, the format of the intervention, or the outcome measure used.

3.7. Anxiety

Anxiety was another frequently measured outcome variable. Three studies used the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) to evaluate changes in anxiety. Using the HADS, Gilbert and Procter (2006) reported that their CMT intervention for a common mental health disorder population ($n = 6$) was associated with significant decreases in anxiety. Ashworth et al. (2014) also reported significant reductions on the HADS anxiety scale in their ABI sample ($n = 12$), and the changes were still significant at 3-month follow-up. In addition to this, Beaumont et al. (2012) used the HADS to evaluate CBT plus CMT for trauma ($n = 16$) compared to CBT only ($n = 16$). Both groups in this study
exhibited significant reductions in anxiety, although neither group was found to show an advantage.

Two papers in the current review used the Beck Anxiety Inventory (BAI; Beck et al., 1988), which is a 21-item self-report measure of anxiety. Judge et al. (2012) reported that their group CFT for individuals with a range of mental health problems \((n = 27)\) was associated with significant reductions in anxiety as measured by the BAI. Judge et al. (2012) also reported that individuals with higher baseline anxiety scores demonstrated fewer improvements in self-soothing thoughts across the course of the intervention. In addition to this, Ashworth et al. (2011) used the BAI with their ABI case study. The individual demonstrated a reliable change in anxiety, with scores moving from the ‘moderate’ to the ‘mild’ range following the intervention.

Three further papers reported changes in anxiety using different measures. As previously mentioned Mayhew and Gilbert (2008) used the Symptom Checklist 90 (SCL-90; Derogatis et al., 1976) to evaluate their CMT intervention for individuals with psychosis \((n = 3)\). The SCL-90 contains a subscale measuring anxiety, and all three individuals in this case series demonstrated reductions in their SCL-90 anxiety scores. Stewart and Holland (2011) used the Generalized Anxiety Disorder Scale (Spitzer et al., 2006) in their CMT group for common mental health problems \((n = 4)\). Three of the four individuals reported in this case series exhibited reductions in anxiety, whilst the fourth member of the group reported increased anxiety (although the authors attributed this to external factors). In contrast, Lucre and Corten (2013) used a short version of the Depression Anxiety Stress Scales (Antony et al., 1998) to evaluate their CFT group for personality disorders \((n = 8)\). Although self-reported anxiety decreased over the course of the group these changes did not reach significance.

All eight studies that measured anxiety reported favourable findings, seven reported significant improvements whilst Lucre and Corten (2013) also reported a positive trend for reductions in anxiety. As with depression symptoms the findings were not confined to particular a clinical population, intervention format, or outcome measure.
4. Discussion

The aim of the current review was to explore the treatment outcomes associated with compassion focused therapies. To achieve this a systematic search was undertaken to identify articles that evaluation compassion focused therapies, and eleven suitable articles were selected and appraised. Rather than focusing on the details of the interventions (as reported by Barnard & Curry, 2011, and Leaviss & Uttley, 2015), the current review focused on the common treatment outcomes associated with compassion focused therapies. Although the analysis in the current review was limited by the heterogeneity of the selected papers, areas of psychopathology that were frequently reported across the studies were identified and discussed. Overall, the current review suggests that compassion focused therapies are associated with a range of benefits, including increases in self-reassurance and self-esteem. Improvements were also commonly reported for shame, social rank indices, and measures of depression and anxiety. These findings are generally consistent with the results of the previous reviews by Barnard and Curry (2011) and Leaviss and Uttley (2015).

An unexpected finding that was overlooked in the review by Leaviss and Uttley (2015) was that compassion focused therapies are not necessarily associated with increases in self-compassion (Laithwaite et al., 2009; Mayhew & Gilbert, 2008). Even in the studies that did report increases in self-compassion the changes were often small or nonsignificant (Beaumont et al., 2012; Braehler et al., 2013; Stewart & Holland, 2011). As a result, the role of self-compassion in compassion focused therapies is not yet clear. Another finding worth noting is that although compassion focused therapies are inherently designed to target self-criticism, several studies in the current review only reported small changes in self-criticism following therapy (Gilbert & Procter, 2006; Judge et al., 2012; Lucre & Corten, 2013). It is hypothesised that in some cases self-correcting and self-attacking processes can function to help individuals maintain their standards, which is why self-criticism can be resistant to change (Gilbert & Procter, 2006).
4.1. Quality Assessment and Limitations of the Reviewed Studies

The quality assessment ensured that the studies included in the current review were of a suitable quality based on the research question being addressed. Overall the general quality of the papers was satisfactory, although the current review is limited by the methodological shortcomings of the existing evidence. Inconsistencies across the studies in terms of treatment protocol, clinical population, and outcome measures made it difficult to confidently compare and contrast findings across studies, and this prevented meaningful comparisons in several key areas. As compassion focused therapies are not a distinct treatment in their own right, it is impossible to distinguish their effects from the effects of the other complementary therapeutic activities or programmes. This is particularly the case where compassion focused techniques are used as an adjunct to other therapeutic programmes (as in Ashworth et al., 2011; Ashworth et al., 2014; Beaumont et al., 2012; and Braehler et al., 2013).

The range of outcome measures reported in the studies cited demonstrates that the consistent findings are not simply an artefact of one measure being used, however the over-reliance on self-report measures raises questions about the validity of some of the findings. The validity of quantitative self-report measures of ‘compassion’ has increasingly been questioned (Lucre & Corten, 2013; MacBeth & Gumley, 2012; Mayhew & Gilbert, 2008). In addition to this, the findings of Laithwaite et al. (2009) also demonstrate that different outcome measures can influence whether or not treatment outcomes are detected. In Laithwaite et al. significant changes in self-esteem were detected using the RSE but not the SCQ or the SIP–AD, which may suggest that one or more of these measures is flawed, or is measuring something different to the others. The current review highlights the need for researchers to carefully consider their choice of outcome measures.

Whilst the current review focused on the common treatment outcomes associated with compassion focused therapies, idiosyncratic outcomes measured in relation to specific clinical populations were not addressed. The transdiagnostic treatment outcomes provide a useful insight into the general effectiveness of compassion focused therapies, but they say very little about the specific treatment outcomes associated with different clinical populations.
It worth noting is that Gilbert was a co-author on six out of the eleven studies included in the current review, which clearly introduces a source of bias into the findings. A further source of bias that also limits the generalisability of the findings pertains to the use of small convenience samples or non-purposive samples in several of the studies. Small sample sizes limit statistical power, meaning that only changes with large effect sizes are likely to be detected. Several of the studies included in the current review did not correct their statistical analyses to reflect their small sample size in order to maximise the likelihood that significant effects would be detected, which increased the possibility of Type I errors. Clearly more rigorous research is needed with larger samples and independent research teams.

4.2. Strengths

The current review goes beyond the reviews by Barnard and Curry (2011) and Leaviss and Uttley (2015) by providing an in-depth overview of the treatment outcomes associated with compassion focused therapies. Despite methodological inconsistencies across the studies reviewed, the consistent treatment outcomes reported suggest that compassion focused therapies are able to reduce psychopathological symptoms in a range of clinical populations. The heterogeneity of the studies simply emphasises that compassion focused therapies can be used to target transdiagnostic issues that are relevant to a broad spectrum of mental health problems. This supports the notion that therapies can be process rather than diagnosis-focused (Gilbert, 2010a).

4.3. Clinical Implications

The cumulative evidence indicates that compassion focused therapies are effective at reducing psychopathology. Several studies in the current review reported positive changes in the clinical status of their sample post-intervention (Ashworth et al., 2014; Gilbert & Procter, 2006; Judge et al., 2012) and two studies confirmed that their treatment outcomes were reliable indicators of clinical change (Ashworth et al., 2011; Gale et al., 2014). On the whole, the evidence for the
The short-term effectiveness of compassion focused therapies is promising, and follow-up data is emerging to suggest that gains in treatment are generally maintained once therapy ends (Ashworth et al., 2014; Laithwaite et al., 2009; Lucre & Corten, 2013).

**4.4. Research Implications**

The studies in the current review mostly stem from practice-based evidence rather than evidence-based practice (Margison et al., 2000). Whilst this may increase the clinical utility of the findings, the studies lack rigour. The clinicians providing the treatment are often responsible for evaluating the programmes, and there is the potential for reporting bias. To address the limitations inherent in many of the studies what is needed now are randomised control trials, with independent researchers blind to the randomisation process. This would increase the quality of the evidence base as well as any subsequent reviews.

Aside from evaluating the effectiveness of compassion focused therapies, researchers also need to start exploring whether or not directly enhancing compassion is an essential component of compassion focused therapies. Although some of the studies included in the current review reported changes in compassion along with reductions in psychopathology, it is still too early to confidently ascertain whether changes in self-compassion drive reductions in psychopathology, or whether changes in self-compassion are an epiphenomena of treatment (MacBeth & Gumley, 2012). Isolating the active mechanisms of compassion focused therapies would help to establish how compassion focused therapies work, and whether or not compassion has an additive effect over and above other traditional psychotherapeutic approaches.

**4.5. Conclusion**

The current review sought to explore the treatment outcomes associated with compassion focused therapies. Positive findings have been found using both individual and group-based interventions in a range of clinical populations. The
findings suggest that compassion focused therapies are associated with increases in self-reassurance and self-esteem, along with decreases in shame, social comparison, depression, and anxiety. Changes in self-compassion and self-criticism are less evident. Whilst compassion focused therapies are not manualised approaches in their own right, studies are starting to show that enhancing standard therapy approaches can lead to better treatment outcomes (Beaumont et al., 2012; Braehler et al., 2013). The current review highlights that to take things forward, more rigorous research is needed to establish the efficacy of compassion focused therapies, as well as understand the mechanisms of change associated with compassion.
References


* Studies included in the literature review


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Empirical Paper

An exploration of heart rate variability reactivity in response to compassion focused therapy for people with eating disorders: A feasibility study
Abstract

Objective: The current study was a small-scale feasibility study that investigated the impact of compassionate imagery on three measures of soothing (heart rate variability [HRV], self-reported soothing, and social safeness). Measures of acceptability and feasibility were included in the study to establish if a larger study would be practicable.

Method: Ten service users attending a compassion focused therapy treatment programme for people with eating disorders (CFT-E) consented to take part. At the beginning, middle, and end of the recovery phase of the CFT-E treatment programme participants carried out a compassionate imagery task during therapy. Participants wore Polar RS800CX heart rate monitors to measure HRV and completed session rating scales and a measure of social safeness. In addition to the soothing measures, treatment outcome measures evaluating the CFT-E programme were examined (including measures of eating disorder symptomatology, shame, and self-criticism).

Results: Practising compassion was generally associated with positive changes in HRV and social safeness, although some of the changes were only observed at the end of therapy. Initial physiological responses tended to be more consistent with a threat response (i.e., lower HRV), whereas later responses were more indicative of soothing responses (i.e., higher HRV). No significant changes were found in self-reported soothing. When the findings were explored on a case-by-case basis individual differences were apparent. Overall the treatment outcome measures support the effectiveness of the CFT-E programme, however changes in the soothing and treatment outcome variables varied within individual participants.

Conclusions: The current study provides preliminary evidence that indicates that compassionate imagery is associated with psychophysiological changes that are akin to soothing. Further research is needed to fully explore how changes in compassion, soothing and psychopathology relate to one another. The findings indicate that further research in similar settings would be viable.
1. Introduction

Fairburn et al. (2003) have proposed that eating disorders have ‘core’ characteristics that can be targeted using transdiagnostic approaches. Compassion focused therapy (CFT) is an approach that was initially developed to help people with high levels of shame and self-criticism (Gilbert, 2010; Gilbert & Procter, 2006). Shame and self-criticism have been identified as important factors in the development and maintenance of eating disorders, meaning that CFT has been recognised as a suitable treatment option for eating disorder populations (Fennig et al., 2008; Gale et al., 2014; Goss & Gilbert, 2002).

1.1. The Model of Compassion

CFT is based on Gilbert’s (2010) model of compassion, which conceptualises compassion as a capacity that is associated with calming and soothing the self. Gilbert’s theory revolves around three motivational systems that regulate affect (presented in Figure 1). Compassion supposedly stimulates the motivational system that drives affiliation and caring behaviours (the ‘soothing’ system), and the positive affect that emerges from this system is thought to be associated with feelings of wellbeing, contentment, and safeness (Depue & Morrone-Strupinsky, 2005).

![Figure 1. Gilbert's (2010) three motivational systems](image-url)
The soothing system is differentiated from the motivational system associated with reward and pleasure seeking (the ‘drive’ system), and the motivational system that is related to self-protection and safety-seeking (the ‘threat’ system). Whilst the drive system functions to promote achievement and positive affect, the threat system promotes harm reduction and is associated with negative affect. The motivational systems work together to regulate our feelings and behaviours, and enable us to meet our biosocial goals and needs (Gilbert, 2010).

Gilbert’s (2010) model suggests that the motivational systems are driven by different neurobiological substrates. The soothing system functions to decrease arousal via increased activation of the parasympathetic nervous system (PNS; Porges, 2007). In contrast the threat and drive systems are associated with increased arousal and activation of the sympathetic nervous system (SNS; Depue & Morrone-Strupinsky, 2005; Porges, 2007). Through inhibitory pathways the soothing system supposedly down-regulates the activation of the threat and drive systems, inducing a state of calm and self-soothing which reduces psychological distress. The key to CFT is how these systems are balanced.

Individuals who are able to switch between all three motivational systems are thought to be more resilient than those individuals who primarily rely on the function of one or two systems (Gilbert, 1989). Indeed, psychological and physiological flexibility are seen as markers of health (Kashdan & Rottenberg, 2010; Kok & Fredrickson, 2010; Porges, 2007). It has been conjectured that dysregulation of the motivational systems results in emotional dysregulation and distress (Gilbert, 2010). CFT is designed to restore the balance of the systems by down-regulating activation of the threat system through exercises that stimulate the soothing system (Gilbert, 2010).

1.2. Compassion Focused Therapy for Eating Disorders (CFT-E)

To enhance the effectiveness of CFT clinicians have started to develop disorder-specific treatment programmes. One such adaptation is a CFT treatment programme for people with eating disorders (CFT-E; Goss & Allan, 2010; Goss & Allan, 2014). CFT-E is designed to explicitly address the high levels of shame and
self-criticism commonly experienced in people with eating disorders (Goss & Allan, 2014). Shame and self-criticism are hypothesised to activate the threat system in the same way that social evaluative threat from others results in negative psychophysiological responses (Dickerson & Kemeny, 2004; Gilbert & Procter, 2006). Both shame and self-criticism have been found to be associated with greater levels of eating disorder psychopathology (Fennig et al., 2008; Kelly & Carter, 2012; Kelly et al., 2013).

To date, only one published study has evaluated the effectiveness of the CFT-E treatment programme: Gale et al. (2014) reported that CFT-E was associated with significant reductions in dietary cognitions and behaviours, as well as improvements in social functioning and wellbeing. A limitation of the study by Gale et al. was that measures of compassion, shame, and self-criticism were not collected. As a result only tentative conclusions could be drawn about the role of compassion as an important change mechanism in the CFT-E programme.

1.3. The CFT-E Treatment Programme

The CFT-E treatment programme is a group-based programme that is delivered in three phases: psychoeducation, skills building, and recovery (Goss & Allan, 2010, 2012, 2014). Sessions 1-2 are psychoeducation groups aimed at helping service users develop an understanding of how eating disorders arise and how they are maintained. These are followed by eight skills building sessions, which focus on the model of compassion and the development of the compassion skills that will be used to help service users in the latter stages of treatment. Examples of skills include practising compassionate attention and compassionate thinking. Sessions 10-20 of the treatment programme are aimed at promoting a compassionate approach to the challenges of recovery. At this point service users are encouraged to engage in normal eating practices and address their eating-related beliefs and behaviours. This is the phase of the treatment programme where the practice of compassion focused exercises becomes paramount.

In order to stimulate the soothing system, CFT-E teaches a range of skills and exercises that are aimed at developing compassion. Three exercises that are useful during the recovery phase of the programme are soothing rhythm
breathing, generating a compassionate image, and directing compassion towards
the self. Akin to mindfulness, the soothing breathing rhythm exercise is a simple
way of increasing one’s self-awareness and is a useful way of developing a “calm
mind” (Gilbert, 2010). In conjunction with this, compassionate imagery is taught to
help individuals experience compassion (Gilbert & Irons, 2004). First service users
are guided to generate images associated with compassion. As their capacity
develops service users are later guided to direct their self-generated compassion
towards themselves. It is proposed that directing compassion towards the self
through compassionate imagery enables service users to activate their soothing
system and down-regulate the activation of their threat system (Gilbert, 2010).

1.4. Compassionate Imagery

The use of mental imagery to generate feelings of compassion is common in
Buddhist practices (Gilbert & Irons, 2004), and it has been proposed that
generating warm and compassionate images is a useful way of cultivating
compassion (Gilbert & Irons, 2005). Gilbert and Irons (2004) first explored the use
of compassionate imagery in a group of people who were considered to be self-
critical. Nine individuals from a self-help depression group attended four sessions
of training in self-soothing and self-compassion. Diaries were used to monitor their
self-critical thoughts and their use of compassionate imagery. Following the group
participants reported a significant improvement in their ability to generate
compassionate images and felt more able to self-soothe. Whilst the findings
support the notion that being compassionate towards oneself is soothing, the
exploratory nature of this pilot study meant that the assumed benefits of
compassionate imagery were only tentative.

More recently Rockliff et al. (2008) carried out an experimental study to
explore the effects of compassionate imagery on the soothing system. Twenty-two
students carried out guided imagery exercises across three conditions: relaxation,
compassion, and control imagery. Throughout the experiment heart rate
variability (HRV) was recorded as a measure of soothing system activation, whilst
salivary cortisol was sampled as a measure of threat system activation. The results
revealed that individuals can have disparate responses to compassionate imagery:
some individuals show a soothing response with increased HRV and reduced salivary cortisol, whereas others show a threat response with decreased HRV and non-significant changes in salivary cortisol. Rockliff et al. were able to determine that those individuals who demonstrated a physiological response akin to soothing during the imagery task were higher in self-reported social safeness and lower in self-reported self-criticism, whereas individuals lower in self-reported social safeness and higher in self-reported self-criticism exhibited more of a defensive physiological response. These findings suggest that although practising compassion may be beneficial for individuals who are open and able to experience it, compassion may be perceived by some individuals as threatening. Our ability to fully explore and understand potential individual differences in response to compassion depends on our ability to accurately measure compassion and the activation of the soothing system.

1.5. Measuring the Soothing System

CFT assumes that being compassionate towards oneself elicits feelings of soothing and contentment as a result of activating the neurobiological system that evolved to facilitate nurturing and affiliative bonding (Depue & Morrone-Strupinsky, 2005; Gilbert, 2010). The biological correlates of this system include neuropeptides such as oxytocin (known as the bonding hormone; Uvnäs-Moberg, 1998), and increased activation of the PNS (Porges, 2007). Whilst compassion supposedly activates this ‘soothing’ system, the empirical evidence to support this is limited.

The most common methodology used to measure soothing and self-compassion has been to ask individuals to complete self-report measures. Diary measures have supported the notion that interventions aimed at enhancing compassion result in increased ease of generating compassionate images, as well as increased feelings of warmth and self-soothing (Gilbert & Irons, 2004; Gilbert & Procter, 2006). Complementary findings of increased self-compassion have also been reported using the Self-Compassion Scale (Neff, 2003; Neff & Germer, 2013). Although the findings are intuitive, the validity of self-report measures of ‘compassion’ has been questioned (MacBeth & Gumley, 2012). Both Neff (2003)
and Mayhew and Gilbert (2008) have queried whether individuals can accurately rate their levels of compassion before engaging in compassionate practices, as individuals new to these approaches may lack awareness of what self-compassion actually feels like. This may suggest that self-report measures of compassion are unable to accurately capture levels of compassion at baseline (i.e., before intervention).

To overcome the shortcomings of self-report measures researchers have started to use objective physiological measures that are thought to reflect activation of the soothing and threat systems. Relevant biological measures include stress hormones, immune response measures, as well as observable changes in HRV. Being able to be compassionate has been shown to buffer one’s physiological response to social evaluative stress in terms of immune response and salivary cortisol (Arch *et al.*, 2014; Cosley *et al.*, 2010; Pace *et al.*, 2009), and changes in autonomic activity as indexed by HRV have also been found in relation to compassionate imagery (Rockliff *et al.*, 2008). Whilst physiological measures reveal more about the relationships between underlying psychological mechanisms and biological systems, physiological responses are influenced by a multitude of factors which limits the validity of psychophysiological approaches on their own.

One other proposed measure related to soothing and compassion is perceived social wellbeing. Being able to stimulate feelings of compassion is hypothesised to enhance our feelings of social connectedness (Gilbert, 2010). Social safeness is a term referring to how safe, warm, and soothing individuals perceive their social worlds to be, and greater self-compassion is thought to result in greater social safeness (Kelly *et al.*, 2012). The Social Safeness and Pleasure Scale (Gilbert *et al.*, 2009) was developed to measure how safe and soothed individuals feel socially, and as shown by Rockliff *et al.* (2008), how socially safe one feels has been associated with how individuals experience compassion (either as soothing or threatening).
1.6. Rationale of the Current Study

Research is needed to empirically test the theoretical model of compassion and to further understand the treatment outcomes associated with CFT treatment programmes. Whilst compassion is thought to be a key mechanism in CFT this conclusion is only tentative. Research has shown that compassionate imagery is associated with increases in self-reported soothing (Gilbert & Irons, 2004; Gilbert & Procter, 2006), however physiological studies have highlighted the need to further explore how different individuals experience compassion (Rockliff et al., 2008).

Many of the studies that have explored the effects of compassion on the soothing system have used experimental designs and/or non-clinical populations (e.g., Arch et al., 2014; Cosley et al., 2010; Rockliff et al., 2008). This means that they have not captured potential changes in responses to compassion over time, and the findings cannot be generalised to clinical populations. Very few studies to date have also investigated whether greater experience of compassion results in greater physiological changes, although preliminary findings suggest that practice effects are evident (Pace et al., 2009). Whilst Rockliff et al. (2008) have previously explored changes in HRV in relation to compassionate imagery it is worth noting that they inferred activation of the soothing system using a global measure of HRV (the SDNN), a metric that is influenced by activation of both the SNS and PNS. As the soothing system is thought to be coupled with the PNS (Gilbert, 2010), it is argued that researchers should also focus on components of HRV that correlate predominantly with the activation of the PNS (e.g., the RMSSD metric).

1.7. Aims

The current study is interested in whether compassionate imagery activates the soothing system as proposed by Gilbert (2010). The soothing measures of interest are HRV, self-reported social safeness, and self-reported soothing. To date there have been no studies that explore these soothing variables in relation to a CFT treatment programme, and as a result it is not known if a psychophysiological study would be acceptable and/or feasible with service users attending a CFT
programme. The current study is particularly interested in whether or not this research would be viable with service users attending a CFT-E treatment programme.

The motivating research question is whether compassionate imagery increases soothing, however it is unclear whether such a study can be done in a naturalistic setting with a clinical population. As a result the current study is a small-scale feasibility study designed to tentatively explore the effects of compassion on the soothing system. If compassionate imagery does stimulate the soothing system as proposed by Gilbert’s (2010) theory, then the following associations would be expected:

1. Compassionate imagery would be associated with increases in HRV
2. Practising compassion would be associated with increases in self-reported social safeness
3. Practising compassion would be associated with increases in self-reported soothing
4. Increases in reported and measured soothing would be associated with improvements in treatment outcome measures

It is anticipated that the current study will be underpowered to sufficiently test the direction of these proposed relationships. Consequently the main aims of the current study are to establish if it is possible to measure soothing whilst service users practise a compassionate imagery task, whilst also exploring whether it would be feasible to extend the research and carry out a similar psychophysiological study on a larger scale.

2. Method

2.1. Design

The study primarily took a quantitative approach, with self-report measures and physiological indices used to measure soothing and treatment outcomes. Secondary to the main research, a qualitative focus group was carried
out with one of the therapy groups to explore the acceptability of the research design.

Previous service users were informed about the proposed study and they advised that they would prefer to undertake the imagery tasks within the therapy group rather than attend for individual homework sessions. As a result the current study used a short-term longitudinal design, with measurements collected during three therapy group practices. This design minimised the additional burden for service users. The ecological validity of the study was also enhanced, as the data was collected during sessions as part of the CFT-E treatment programme.

2.2. Participants

The current participants were recruited from an eating disorder service that ran CFT-E therapy groups. Services users were eligible to participate if they were over the age of 18 and met criteria to receive treatment at the eating disorder service. The exclusion criteria for the service are as follows: recent history of self-harm, current risk of suicide or self-harm, current illegal drug use or misuse of alcohol, current diagnosis of psychosis, current risk of aggressive behaviour, or an intellectual disability that would preclude them from engaging in group treatment. Additional exclusion for the current study were known cardiovascular problems, as these would affect the physiological recordings; participation was also limited to people whose first language was English, as some of the questionnaires have only been validated with English-speaking populations.

Service users attending the CFT-E treatment programme were invited to opt-in to the study by clinicians running the therapy groups (the participant invitations, information sheets, and consent forms are located in Appendix E). Twelve service users from three therapy groups opted in to take part, and after demonstration meetings written consent was obtained. Two service users were excluded from the therapy groups for clinical reasons, which resulted in a final study sample of 10 participants (five males, five females, age range = 19-43 years). One participant had a diagnosis of anorexia nervosa, two participants had diagnoses of bulimia nervosa, and the remaining seven participants had diagnoses
of eating disorder not otherwise specified (EDNOS). All participants were Caucasian.

2.3. Materials

2.3.1. Soothing measures. Activation of the soothing system was measured by recording heart rate variability (HRV), self-reported social safeness and self-reported soothing.

Psychophysiological recordings of HRV were collected using Polar RS800CX heart rate monitors. Two components of HRV were of interest in the current study. Firstly, the standard deviation of beat-to-beat intervals (SDNN) was calculated as a global measure of HRV, as in the study by Rockliff et al. (2008). The root mean square of successive differences in beat-to-beat intervals (RMSSD) was also calculated, as this metric of HRV is thought to predominantly reflect the activation of the PNS (Hayano et al., 1991; Task Force, 1996). Increases in HRV suggest that an individual is in a state of calm and self-soothing, whilst decreases in HRV suggest that an individual is in a state of defence (Porges, 2007).

Social safeness was measured using the Social Safeness and Pleasure Scale (Gilbert et al., 2009; Appendix F), which is an 11-item scale designed to measure the extent to which people experience their social worlds as safe, warm, and soothing. The items relate to feelings of belonging, acceptance, and feelings of warmth from others. Higher scores are indicative of higher social safeness. The Social Safeness and Pleasure Scale has not been psychometrically evaluated in full, and has so far mainly been used with student populations. Gilbert et al. (2009) originally reported that the scale has a Cronbach’s alpha of .91, and verified the single factor structure of the scale using exploratory factor analysis. Kelly and Carter (2014) also recently reported using the scale with a sample of 89 people with eating disorders and reported a Cronbach’s alpha of .94.

Self-reported soothing was measured using session rating scales that were developed to capture state-related changes soothing in response to the compassionate imagery exercise (Appendix G). They also aimed to capture information about the frequency and success of practising the imagery exercise outside of therapy. The session rating scales were developed specifically for the
current study and were based on existing rating scales, for example Gilbert and Procter (2006) previously constructed similar scales to record people’s experiences of practising compassionate imagery. Example questions include “how successful were you at generating a compassionate image” and “how comforting was your compassionate image”. Each statement was rated on a five-point scale (Not at all to Extremely).

2.3.2. Treatment outcome measures. The eating disorder service routinely uses the following measures to evaluate its CFT-E treatment programme: the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994); the Stirling Eating Disorder Scale (SEDS; Williams et al., 1994); the Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM; Evans et al., 2000); the Internalized Shame Scale (Cook, 1994, 1996); the Other As Shamer Scale (OAS; Allan et al., 1994; Goss et al., 1994); the Self-Compassion Scale (SCS; Neff, 2003); the Forms of Self-Criticizing/Attacking and Self-Reassuring Scale (FSCRS; Gilbert et al., 2004); and the Functions of Self-Criticising/Attacking and Self-Reassuring Scale (FSCS; Gilbert et al., 2004). Copies of the routine treatment outcome measures are located in Appendix H. The characteristics and psychometric properties of each of these measures are outlined below:

The Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) consists of 28 questions about the frequency of eating disorder behaviours and severity of the psychopathological aspects of eating disorders over the last 28 days. Together the items produce four subscales (restraint, eating concern, weight concern and shape concern) and a global score, with higher scores indicating higher symptomatology. A systematic review by Berg et al. (2012) indicated that the EDE-Q is a reliable and valid measure of eating disorder symptomatology, although whether the EDE-Q can distinguish between eating disorder cases and non-cases was considered questionable.

The Stirling Eating Disorder Scale (SEDS; Williams et al., 1994) is an 80-item questionnaire designed to assess the cognitive and behavioural symptoms of eating disorders. There are eight subscales, four dietary scales (anorexic cognitions, anorexic behaviours, bulimic cognitions and bulimic behaviours) and four non-dietary scales (perceived external control, assertiveness, self-esteem and self-directed...
In addition to the subscales a total score can be calculated. Research indicates that the Cronbach’s alpha coefficient for the SEDS total score is high ($\alpha = .84$), suggesting that the overall scale is a cohesive measure of general eating-disorder psychopathology (Openshaw & Waller, 2005).

The Clinical Outcomes in Routine Evaluation–Outcome Measure (CORE-OM; Evans et al., 2000) is a 34-item that assesses psychological distress, and it is one of the most widely used outcome measures for psychological therapies. There are four main factors (wellbeing, functioning, problems, and risk) and a global score can also be calculated. Higher scores on the CORE-OM are indicative of greater levels of distress. Evans et al. (2002) demonstrated that the CORE-OM has good internal consistency ($\alpha = .94$) and high test-retest reliability ($r = .90$). In addition to this the CORE-OM has good convergent validity and has been shown to be sensitive to change (Evans et al., 2002).

The Internalized Shame Scale (Cook, 1994, 1996) is a measure of negative self-evaluation. The ISS consists of 30 items: six items comprise a self-esteem subscale whilst the remaining 24 items comprise the internalized shame scale. Higher scores for each subscale are indicative of higher levels of self-esteem and internalized shame. Cook (1994) reported that the ISS has high internal consistency ($\alpha = .95$) and reasonable test–retest reliability ($r = .69$).

The Other As Shamer Scale (OAS; Allan et al., 1994; Goss et al., 1994) is an 18-item measure of external shame exploring judgements about how the individual thinks he/she is judged, thought of, and evaluated by others. Higher scores are indicative of higher levels of external shame. In the original study, the scale showed high internal consistency with a Cronbach’s alpha of .92 (Goss et al., 1994).

The Self-Compassion Scale (SCS; Neff, 2003) is a 26-item self-report measure that assesses the three components of self-compassion defined by Neff (2003): self-kindness, common humanity, and mindfulness. The three subscales are strongly correlated allowing a single higher-order factor of self-compassion to be calculated, which is more commonly reported than the lower-order factors. Higher scores on the SCS are indicative of greater self-compassion. Neff (2003) reported
that the SCS demonstrates good internal consistency reliability ($\alpha = .92$), as well as good test–retest reliability ($r = .93$).

The Forms of Self-Criticizing/Attacking and Self-Reassuring Scale (FSCRS; Gilbert et al., 2004) is a 22-item measure that assesses how critical/attacking or supportive/reassuring individuals are when they experience a setback or disappointment. The scale comprises three components: two measures of self-criticism (inadequate self and hated self), and a third measure of self-reassurance (reassured self). In the original study Gilbert et al. (2004) reported that the Cronbach’s alphas for each subscale were above .86.

The Functions of Self-Criticising/Attacking and Self-Reassuring Scale (FSCS; Gilbert et al., 2004) is a 21-item self-report measure which complements the FSCRS by looking at the reasons for individuals being self-attacking or self-reassuring. Factor analysis suggests that the FSCS measures two separate factors: self-correction, a factor concerning wanting to improve performance and keep up one’s standards; and self-persecution, which is concerned with dislike and contempt for the self. According to Gilbert et al. (2004) both subscales have Cronbach’s alphas of .92.

2.3.3. Acceptability and feasibility measures. The acceptability of the study was assessed by establishing the participation and completion rates for the study. The acceptability of the research design was also evaluated through a small focus group, which took place at the end of one of the therapy groups.

To evaluate the feasibility of completing a larger scale study the current findings were investigated. Trends in the data were examined to determine whether or not compassionate imagery was associated with changes in soothing and/or treatment outcomes. Where available the observed effect sizes for these trends were then used to carry out power calculations to determine the number of participants needed for a larger study.

2.4. Procedure

2.4.1. Recruitment. Participants were service users attending CFT-E therapy groups at an eating disorder service. To inform service users of the research study
they were given a participant invitation letter and a participant information sheet at the end of the psychoeducation part of the CFT-E treatment programme (copies are located in Appendix E). The information sheet explained the purpose of the study and provided details of how service users could opt-in to take part in the research. Potential participants were asked to meet with the lead researcher prior to starting the study in order to clarify the study protocol and the clinical implications of the study in more detail. During this meeting the lead researcher was able to demonstrate the heart rate monitor being used, and if the service user agreed they also had the opportunity to experience wearing the equipment. If a service user wished to take part in the research after this meeting, the lead researcher obtained written consent.

2.4.2. Data collection. Routine treatment outcome data is collected as part of the treatment programme by the clinicians facilitating the CFT-E groups. The clinicians are qualified healthcare professionals with experience of running CFT-E groups for individuals with eating disorders. The routine treatment outcome data collected by the clinicians at initial assessment and post-recovery programme were available to explore changes in the treatment outcome variables (i.e., pre- and post-therapy). The lead researcher collected the additional data required for the current study; this included the consent data, the HRV data, the Social Safeness and Pleasure Scale data, the session ratings data, and the focus group data.

As mentioned previously, CFT-E is a three-step treatment programme. Step three is the recovery phase (sessions 10-20), which is where most of the compassionate imagery practice occurs. Data collection for the current study took place before, during, and after the recovery phase of the CFT-E treatment programme at sessions 11, 15, and 19. Taking part in the research study involved attending the CFT-E group as usual. During the specified sessions a standard imagery task from the CFT-E programme was completed whilst the participants wore the heart rate monitors. To allow participants the opportunity to practice down regulating their threat system, participants were first guided to think about a difficulty they had faced in the last week (for example, sticking to their meal plan). Following 90 seconds of threat activation, participants were subsequently directed to follow a compassionate imagery task. The imagery task lasted for nine-
minutes and involved three of the main compassionate practices taught in the group: soothing breathing rhythm, generating a compassionate image, and directing compassion towards the self. The compassionate imagery task was pre-recorded and the script for the task is located in Appendix I. At the end of these sessions the participants were asked to complete the Social Safeness and Pleasure Scale and the session rating scales.

At the end of the treatment programme participants from the first therapy group were invited to take part in a brief focus group to discuss the acceptability of the study protocol. The focus group involved service users attending the service for an additional 30 minutes on top of their usual attendance. Further details of the focus group methodology are located in Appendix J.

2.5. Position of Researcher

Clinicians at the service were responsible for all clinical aspects of the treatment programme and were responsible for collecting the routine questionnaire data. The lead researcher was independent from the service and was only involved in aspects of the treatment programme that directly related to the study, for example participant recruitment from the therapy groups and the study-specific data collection. The Compassionate Mind Foundation provided the funding for the heart rate monitors.

2.6. Ethical Considerations

As the participants were service users recruited from an NHS service, NHS Ethics was obtained prior to the start of the study. The study was granted approval from the local Research Ethics Committee on 21st February 2014 (the approval letters are located in Appendix K).

2.7. Data Analysis

For the statistical analyses IBM SPSS Statistics (version 20.0, IBM Corp., Armonk, NY) was used, with the alpha set to .05 (two-tailed unless otherwise
specified. As this was a preliminary study it was anticipated that there would be insufficient power to detect changes in the several of the outcome measures due to the sample size. Although the validity of any inferential statistics was limited by the study's sample size, analyses were carried out to explore the effects of compassionate imagery on the soothing variables. Changes in the treatment outcome measures were also examined. Observed effect sizes were noted where possible in order to determine how many participants would be needed to sufficiently power a larger study.

2.7.1. Soothing data analysis. The HRV data was extracted from the heart rate monitors using Polar ProTrainer 5 Software (Polar CIC, USA) and was corrected for abnormal beats and artefacts using the Polar software’s automated analysis feature. The interbeat intervals were exported and analysed using Kubios HRV Analysis Software 2.2 (freeware available from http://kubios.uef.fi). Both SDNN and RMSSD components of HRV were calculated. As different forms of imagery may have different psychophysiological effects, HRV was extracted separately for each of the practices within the imagery task. Change scores were then calculated by subtracting the mean HRV for each 3-minute imagery task from the mean HRV for the 90-second threat task. This resulted in SDNNchange and RMSSDchange data for the soothing, compassionate image, and compassion to self imagery tasks. Imagery task was included in several of the analyses as a repeated-measures factor.

The soothing variables were examined for normality of distribution using histograms and Kolmogorov–Smirnov tests. The RMSSDchange data was negatively skewed. Tabachnick and Fidell (2007) recommend reflecting negatively skewed variables before applying transformations to non-normal data. After reflecting the variable and applying a Log-10 transformation the RMSSDchange data approximated a normal distribution, therefore the transformed RMSSDchange variable was used in all of the analyses. Outliers were present in both the SDNNchange and transformed RMSSDchange variables, and so the analyses for the HRV data were performed with and without outliers.

Mixed models were used to explore changes in the HRV and social safeness data at the group level. This is because mixed models are able to explore both fixed
effects (effects that are constant across participants) and random effects (sources of random variation) (Verbeke & Molensberghs, 2000). Mixed models are preferable compared to generalised linear models because they are able to handle correlated data as well as missing data (Verbeke & Molensberghs, 2000). Although mixed models are more flexible than generalised linear models, it is important that the analysis is carried out using an appropriate covariance structure: Models that are too simple and ignore important within-subject correlations increase Type I error rates, whilst models that are too complicated lead to decreased power for detecting fixed effects (Littell et al., 2002). Where possible, a simpler covariance structure that best fits the data should be chosen. This is achieved by considering the study design and exploring the patterns of covariance within the data. Model fit statistics are then used to identify the best model of choice.

The session rating scales were also analysed to explore changes in self-reported soothing. As they comprised ordinal level data, Friedman’s tests were used to explore changes in the session rating scale items over the three sessions.

2.7.2. Treatment outcome analysis. The routine questionnaire data were screened for missing values, invalid values, and outliers. Missing values were handled as follows: Where up to three items were missing, means were computed to fill in missing values. This was the case only if the missing items came from different subscales; otherwise the subscale was not used in the analysis. As the SEDS items are weighted, missing data from the SEDS meant that subscales with missing data were not included in the analyses.

The screened routine questionnaire data were examined for normality of distribution using histograms and Kolmogorov–Smirnov tests. Although initial assessment data was available for most participants, missing cases were excluded pairwise from the treatment outcome analyses. The treatment outcome analyses were limited by the small number of questionnaire packs completed by participants at both initial assessment and post-recovery (n = 5). The sample size was too small to power multivariate analyses of variance (MANOVAs) and so paired t-tests were used to explore changes in the treatment outcome data. Paired t-tests are robust with small samples, although it is noted that small effect sizes can go undetected resulting in Type II errors (de Winter, 2013). Due to the
expected low power of the $t$-tests and the fact that this was a preliminary study, the $p$ values of the $t$-tests were not adjusted for multiple comparisons using Bonferroni corrections. It is recognized that whilst a Bonferroni correction can control for Type I errors, it becomes increasingly conservative as the number of tests increases which further increases the likelihood of Type II errors (Bland & Altman, 1995). The main analyses were not adjusted for multiple comparisons to maximize the likelihood that important effects would be detected, however the effects of the Bonferroni correction were reported so it is clear where significant effects may have been exaggerated.

2.7.3. Treatment outcomes and soothing. Due to a large proportion of missing data from the routine questionnaires, it was not feasible to carry out statistical analyses to explore relationships between the soothing and treatment outcome measures. To explore this in more depth the findings were examined on a case-by-case basis.

2.7.4. Acceptability and feasibility analysis. To determine the acceptability and feasibility of the current study, participation and completion rate data were inspected using descriptive statistics. Effect sizes for the main statistical analyses were also used to estimate the number of participants needed for a fully powered study. In addition to these quantitative indices, the qualitative data from the focus group was transcribed and analysed using thematic analysis (Braun & Clarke, 2006). This approach was chosen for the current study because short pieces of written information could be analysed without the need for pre-conceived theories about the themes that would emerge (Miles & Huberman, 1994).

3. Results

3.1. Changes in Soothing

3.1.1. Heart rate variability. If compassion stimulates the soothing system as proposed by Gilbert (2010), compassionate imagery should be associated with increases in HRV. All ten participants completed the HRV recordings for the three
CFT-E sessions. As can be seen in Figure 2 and Figure 3 changes in the HRV variables seemed to vary according to session. The mean changes observed suggest that global HRV (as indexed by SDNN) tended to continuously decrease during the imagery tasks in sessions 11 and 15, but continuously increase in session 19. The component of HRV associated with activation of the PNS (RMSSD) also reduced in sessions 11 and 15, but increased in session 19.

Mixed modelling analyses were carried out on both the SDNNchange and the transformed RMSSDchange HRV data to explore the fixed effects of Session and Imagery Task, and the random effects of Participant. The model fit statistics and the F-test values for the mixed models are located in Appendix L. An Autoregressive (AR1) covariance structure was the simplest model with the best fit for the SDNNchange data. An AR1 covariance structure assumes that variances are homogeneous and correlations between measurements decline exponentially with distance i.e., measurements that are further apart in time are less correlated than measurements that are close together in time (Littell et al., 2000). The selected model revealed a significant effect of Session on SDNNchange ($F(2, 42.78) = 3.89, p = .028$), although when the analysis was repeated with the inclusion of outliers this effect was no longer significant ($F(2, 46.25) = 1.02, p = .369$). No significant effects were found for Imagery Task or the Session x Imagery Task interaction.

Reviewing the transformed RMSSDchange data revealed that this variable was best suited to a Compound Symmetry (CS) covariance structure i.e., correlations between measurements were fairly constant (Littell et al., 2000). The CS model revealed a significant effect of Session on the transformed RMSSDchange variable ($F(2, 63.21) = 4.21, p = .019$), and the effect of Session remained significant ($F(2, 72) = 3.73, p = .029$) when the model was re-run with outliers included. No significant effects were found for Imagery Task or the Session x Imagery Task interaction.
Figure 2. Mean SDNN change (ms) as a function of Session and Imagery Task ($n = 10$). Error bars represent the standard error.

Figure 3. Mean RMSSD change (ms) as a function of Session and Imagery Task ($n = 10$). The data shown represent the raw RMSSD change data. Error bars represent the standard error.
Taken together, the observed changes in HRV indicate that the compassionate imagery task was associated with increases in soothing, however it was not until the end of therapy that these changes were observed. Participants initially exhibited a physiological response that was indicative of threat, which then shifted to a soothing response at session 19. As a result of the apparent delay in positive HRV changes, the expected direction of the association between compassionate imagery and increased HRV was partially supported on the basis of the group-level findings.

3.1.2. Social safeness. Practising compassion was expected to be associated with increased social safeness. The means for the Social Safeness and Pleasure Scale scores across the three sessions are shown in Figure 4. The trend observed suggests that social safeness tended to increase during the CFT-E treatment programme.

![Figure 4. Mean Social Safeness and Pleasure Scale scores across each session (Session 11 n = 10, session 15 n = 10, session 19 n = 7). Error bars represent the standard error.](image)

A mixed modelling analysis was carried out on the Social Safeness and Pleasure Scale data, with Session as a fixed effect and Participant as a random
effect. An AR1 covariance structure resulted in the simplest model with the best fit. The model fit statistics and the $F$-test values for the model are located in Appendix L. The model revealed a significant effect of Session ($F(2, 15.36) = 6.33, p = .010$), upholding the observation that social safeness increased over time. Consequently the expectation that compassion would be associated with increased social safeness was supported on the basis of the group-level findings.

3.1.3. Session rating scales. To capture changes in self-reported soothing participants were asked to complete session rating scales in response to the compassionate imagery exercise. The rating scales aimed to capture information about the participants’ experiences of practising compassion both within and outside of the sessions. Seven participants completed these measures for all three sessions (three participants were missing data at session 19), which limited the power of the analyses.

The median ratings for the session rating scales are shown in Figure 5 and Figure 6. One participant reported not practising the week before session 15 and two participants reported not practising the week before session 19 resulting in the practice ratings being omitted for these time-points. The analyses of the practice ratings are consequently based on the data from five participants. The practice ratings showed small increases in how successful, how powerful, how comforting and how helpful participants found their compassionate imagery to be during the weeks preceding the sessions. Although several of the practice ratings increased, according to Friedman's tests none of the changes in the practice ratings were statistically significant.

The within session ratings were available for seven participants at all three time points. The within session ratings indicated a slight increase from session 11 to session 15 in how easy it was for participants to maintain their compassionate image which was maintained at session 19. Increases in how comforting and the helpfulness of the compassionate images from session 11 to session 15 were observed but these increases were not maintained at session 19. Friedman's tests confirmed that none of the changes observed in the within session ratings were statistically significant. The expected association between practising compassion and self-reported soothing was consequently not detected.
Figure 5. Median ratings for the session rating scales exploring changes in compassionate imagery over the last week ($n = 5$).

Figure 6. Median ratings for the session rating scales exploring changes in compassionate imagery during the session ($n = 7$).
3.2. Treatment Outcomes

The number of completed treatment outcome subscales ranged from 255 at initial assessment (completed questionnaire packs $n = 9$) and 166 at post-recovery (completed questionnaire packs $n = 6$). Pre- and post-therapy data was available for five participants (four males, one female, age range = 19-31 years). The mean and standard deviations for the treatment outcome data are presented in Table 1, along with the $t$-test statistics and observed effect size for each comparison (effect size was calculated using Cohen’s $d$; Cohen, 1992). As it was expected that the treatment outcomes would improve from initial assessment to post-recovery the $p$ value for the $t$-tests was set to .05 (one-tailed). As stated previously, due to the small sample size the $p$ values for the $t$-tests were not initially adjusted for multiple comparisons using a Bonferroni correction, as this would restrict the likelihood of important outcomes being detected.

All of the treatment outcome measures were associated with improvements, although not all of the changes were statistically significant. In terms of psychological distress, the CORE–OM revealed significant improvements in wellbeing ($t(4) = 5.17, p = .004$), problems ($t(4) = 2.30, p = .042$), and functioning ($t(4) = 3.18, p = .017$). In addition to this, the ISS revealed a significant increase in self-esteem ($t(4) = -3.31, p = .015$). Significant improvements were also detected in relation to eating disorder symptoms. The EDE–Q changes revealed reductions in restraint ($t(4) = 32.24, p < .001$), eating concern ($t(4) = 9.31, p < .001$), shape concern ($t(4) = 7.47, p = .001$), and weight concern ($t(4) = 4.80, p = .005$). The SEDS also highlighted significant reductions in assertiveness ($t(4) = 2.39, p = .038$), self-directed hostility ($t(4) = 2.53, p = .033$), perceived control ($t(1) = 6.90, p = .046$), anorexic cognitions ($t(3) = 10.04, p = .001$) and anorexic behaviours ($t(3) = 3.67, p = .018$). In terms of self-criticism the FSCRS found a significant reduction in inadequate self ($t(4) = 3.40, p = .014$) and hated self ($t(4) = 2.50, p = .034$) along with an increase in reassured self ($t(4) = -3.08, p = .019$). The SCS also revealed significant improvements in self-judgement ($t(4) = 4.09, p = .008$) and reduced isolation ($t(4) = 5.59, p = .003$) and over-identification ($t(4) = 2.28, p = .043$).
<table>
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<tr>
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<th>Initial assessment mean (SD)</th>
<th>Post-recovery mean (SD)</th>
<th>t-test, effect size</th>
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<td><strong>CORE-OM</strong></td>
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<td>Wellbeing ( (n=5) )</td>
<td>2.45 (0.97)</td>
<td>0.55 (0.52)</td>
<td>( t(4)=5.17, p=.004, d=2.31 )</td>
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<td>Problems ( (n=5) )</td>
<td>1.62 (0.70)</td>
<td>0.97 (0.83)</td>
<td>( t(4)=2.30, p=.042, d=1.03 )</td>
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<td>Functioning ( (n=5) )</td>
<td>1.63 (1.07)</td>
<td>0.88 (0.81)</td>
<td>( t(4)=3.18, p=.017, d=1.42 )</td>
</tr>
<tr>
<td>Risk ( (n=5) )</td>
<td>0.43 (0.40)</td>
<td>0.27 (0.28)</td>
<td>( t(4)=1.58, p=.095, d=0.71 )</td>
</tr>
<tr>
<td><strong>EDE-Q</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Restraint ( (n=5) )</td>
<td>4.28 (0.48)</td>
<td>0.52 (0.41)</td>
<td>( t(4)=32.24, p&lt;.001, d=14.42^* )</td>
</tr>
<tr>
<td>Eating Concern ( (n=5) )</td>
<td>3.56 (0.30)</td>
<td>0.64 (0.43)</td>
<td>( t(4)=9.31, p&lt;.001, d=4.16^* )</td>
</tr>
<tr>
<td>Shape Concern ( (n=5) )</td>
<td>5.03 (0.49)</td>
<td>1.90 (1.40)</td>
<td>( t(4)=7.47, p&lt;.001, d=3.34^* )</td>
</tr>
<tr>
<td>Weight Concern ( (n=5) )</td>
<td>3.88 (1.58)</td>
<td>0.76 (0.52)</td>
<td>( t(4)=4.80, p=.005, d=2.15 )</td>
</tr>
<tr>
<td><strong>SEDS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assertiveness ( (n=5) )</td>
<td>20.10 (12.40)</td>
<td>6.34 (5.21)</td>
<td>( t(4)=2.39, p=.038, d=1.07 )</td>
</tr>
<tr>
<td>Self-Esteem ( (n=4) )</td>
<td>20.48 (8.45)</td>
<td>8.50 (8.80)</td>
<td>( t(3)=1.70, p=.094, d=0.85 )</td>
</tr>
<tr>
<td>Self-Directed Hostility ( (n=5) )</td>
<td>18.22 (8.16)</td>
<td>6.74 (7.94)</td>
<td>( t(4)=2.53, p=.033, d=1.13 )</td>
</tr>
<tr>
<td>Perceived Control ( (n=2) )</td>
<td>8.30 (0.57)</td>
<td>1.40 (1.98)</td>
<td>( t(1)=6.90, p=.046, d=4.88 )</td>
</tr>
<tr>
<td>Anorexic Cognitions ( (n=4) )</td>
<td>35.88 (2.05)</td>
<td>4.18 (4.82)</td>
<td>( t(3)=10.04, p=.001, d=5.02^* )</td>
</tr>
<tr>
<td>Anorexic Behaviours ( (n=4) )</td>
<td>15.68 (7.60)</td>
<td>1.83 (2.36)</td>
<td>( t(3)=3.67, p=.018, d=1.84 )</td>
</tr>
<tr>
<td>Bulimic Cognitions ( (n=3) )</td>
<td>29.47 (11.95)</td>
<td>18.23 (3.30)</td>
<td>( t(2)=1.80, p=.107, d=1.04 )</td>
</tr>
<tr>
<td>Bulimic Behaviours ( (n=3) )</td>
<td>22.07 (14.90)</td>
<td>4.90 (1.39)</td>
<td>( t(2)=2.17, p=.081, d=1.25 )</td>
</tr>
<tr>
<td><strong>OAS ( (n=5) )</strong></td>
<td>30.20 (23.06)</td>
<td>17.00 (17.96)</td>
<td>( t(4)=1.29, p=.133, d=0.58 )</td>
</tr>
<tr>
<td><strong>ISS</strong></td>
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<tr>
<td>Self-Esteem ( (n=5) )</td>
<td>10.40 (5.86)</td>
<td>16.00 (7.11)</td>
<td>( t(4)=-3.31, p=.015, d=-1.48 )</td>
</tr>
<tr>
<td>Shame ( (n=5) )</td>
<td>35.25 (20.35)</td>
<td>28.00 (29.07)</td>
<td>( t(4)=1.50, p=.105, d=0.67 )</td>
</tr>
<tr>
<td><strong>FSCS</strong></td>
<td></td>
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</tr>
<tr>
<td>Self-Correction ( (n=5) )</td>
<td>16.40 (12.82)</td>
<td>15.40 (11.89)</td>
<td>( t(4)=0.23, p=.414, d=0.10 )</td>
</tr>
<tr>
<td>Self-Persecution ( (n=5) )</td>
<td>7.00 (6.44)</td>
<td>4.00 (4.69)</td>
<td>( t(4)=1.02, p=.184, d=0.45 )</td>
</tr>
<tr>
<td><strong>FSCR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate Self ( (n=5) )</td>
<td>25.00 (7.48)</td>
<td>12.40 (9.21)</td>
<td>( t(4)=3.40, p=.014, d=1.52 )</td>
</tr>
<tr>
<td>Reassured Self ( (n=5) )</td>
<td>9.40 (4.93)</td>
<td>19.20 (8.41)</td>
<td>( t(4)=-3.08, p=.019, d=-1.38 )</td>
</tr>
<tr>
<td>Hated Self ( (n=5) )</td>
<td>9.20 (5.72)</td>
<td>4.20 (4.44)</td>
<td>( t(4)=2.50, p=.034, d=1.12 )</td>
</tr>
<tr>
<td><strong>SCS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Kindness ( (n=5) )</td>
<td>1.64 (0.43)</td>
<td>2.44 (0.62)</td>
<td>( t(4)=-2.08, p=.053, d=-0.93 )</td>
</tr>
<tr>
<td>Self-Judgement ( (n=5) )</td>
<td>3.92 (0.59)</td>
<td>2.40 (0.86)</td>
<td>( t(4)=4.09, p=.008, d=1.83 )</td>
</tr>
<tr>
<td>Common Humanity ( (n=5) )</td>
<td>1.60 (0.52)</td>
<td>2.60 (1.04)</td>
<td>( t(4)=-2.05, p=.055, d=-0.92 )</td>
</tr>
<tr>
<td>Isolation ( (n=5) )</td>
<td>3.35 (0.76)</td>
<td>2.10 (0.88)</td>
<td>( t(4)=5.59, p=.003, d=2.50 )</td>
</tr>
<tr>
<td>Mindfulness ( (n=5) )</td>
<td>2.25 (0.25)</td>
<td>2.90 (1.04)</td>
<td>( t(4)=-1.15, p=.158, d=-0.51 )</td>
</tr>
<tr>
<td>Over Identified ( (n=5) )</td>
<td>3.85 (0.74)</td>
<td>2.45 (1.00)</td>
<td>( t(4)=2.28, p=.043, d=1.02 )</td>
</tr>
</tbody>
</table>

Note: \( p \) values (one-tailed) have not been adjusted for multiple comparisons.

\* = significant when the Bonferroni correction is applied \( (p = 0.0017) \)
If a Bonferroni correction was applied to adjust for the large number of comparisons made, the significance level became 0.0017. This correction meant that only the improvements in the restraint \( t(4) = 32.24, p < .001 \), eating concern \( t(4) = 9.31, p < .001 \), and shape concern \( t(4) = 7.47, p = .001 \) subscales of the EDE-Q remained significant, along with the anorexic cognitions subscale of the SEDS \( t(3) = 10.04, p = .001 \). Even when the findings were corrected for multiple comparisons they indicate that CFT-E is a promising treatment for people with eating disorders.

3.3. Treatment Outcomes and Soothing

To explore the relationship between the soothing and treatment outcome variables the soothing and treatment outcome data were explored on a case-by-case basis (the findings are presented in Appendix M). Reviewing the individual data revealed patterns of variation within the soothing and treatment outcome variables that were inconsistent with the group-level findings.

The individual data revealed that whilst the majority of participants moved from a physiological pattern of threat (i.e., decreased HRV) to a soothing response (i.e., increased HRV) over the recovery phase, at least one participant continued to demonstrate a threat response, albeit to a lesser degree towards the end of therapy. Interestingly the participant that continued to exhibit a physiological threat response still reported improvements in relation to their social safeness, eating disorder symptomatology, shame, and self-criticism. In contract to this, a second case was identified where a participant demonstrated an increased soothing pattern in their HRV response and improvements in relation to their eating disorder symptomatology whilst showing little change in their self-criticism and deteriorations in their social safeness and internalized shame scores. These findings indicate that the anticipated relationships between the soothing and treatment outcome variables were not as straightforward as proposed.

Once the individual findings were taken into account, several of the group-level findings were brought into question. The individual findings revealed that whilst relative increases in HRV were common across participants, an individual’s improved HRV profile might still be indicative of a threat response. In addition to
this, the collective increase in social safeness was not universal, and the observed changes did not necessarily correspond to changes in HRV. Thus the evidence to suggest that practising compassion was associated with increases in HRV, social safeness, and treatment outcomes was not unequivocal.

3.4. Accessibility Measures

3.4.1. Participation rates. The flow of recruitment is shown in Figure 7. From March 2014 until February 2015 three CFT-E therapy groups were completed. Twenty-five service users were invited by the clinicians at the service to access the therapy groups. Eighteen service users (72%) started the therapy groups and all of them were approached to take part in the study. Twelve service users (67%) agreed to meet with the lead researcher for demonstrations of the equipment, and all twelve proceeded to consent to take part in the research. Two participants from the first group were excluded from treatment for clinical reasons, resulting in a final study sample size of ten participants. Overall, of the sixteen service users who completed the treatment programme, 63% took part in the study. None of the participants withdrew from the study once data collection had begun.

![Figure 7. Recruitment flow diagram.](image-url)
3.4.2. Completion rates. All ten participants completed the heart rate recordings for the three CFT-E sessions. This was an important finding, as prior to the study it was not known how well people with eating disorders would tolerate wearing the heart rate monitors. For the self-report soothing measures, seven participants (70%) completed the session rating scales and the Social Safeness and Pleasure Scales for all three sessions, whilst three participants (30%) only completed these measures for session 11 and session 15. In terms of treatment outcome data, nine participants completed the routine measures at initial assessment (90%), and six completed them at post-recovery (60%). This resulted in five sets of questionnaires (50%) that could be compared pre-and post-treatment.

With regard to missing data, 255/300 possible subscales were completed at initial assessment resulting in a completion rate of 85% (completed questionnaire packs \( n = 9 \), with data missing from 15 subscales in the completed packs). At post-recovery 166/300 subscales were completed resulting in a completion rate of 55% (completed questionnaire packs \( n = 6 \), with data missing from 14 subscales in the completed packs). Further investigation revealed that 28 out of 29 of the missing subscales were from the SEDS questionnaire. The substantial amount of missing data from the SEDS suggests that this measure may have been less acceptable to service users than the other treatment outcome measures.

3.4.3. Focus group findings. The main findings from the focus group are outlined in Appendix J. The qualitative feedback from the two participants who took part in the focus group indicates that the study protocol was acceptable. Whilst the participants reported that they could feel self-conscious when initially wearing the heart rate monitors, this feeling diminished over time. The participants reported that wearing the heart rate monitors was not uncomfortable, and that taking part in the research did not seem to affect their experience of the treatment programme. The participants also felt that the current expectation of three time-points was acceptable in terms of time commitment.

Regarding the design of the study, the participants reflected that completing the research within sessions reduced the impact of the research and maximised the likelihood of participants taking part. They also reflected that the timing of
research was important, both in terms of when the research is introduced but also the frequency of data collection. It was noted that additional burdens on service users could be interpreted as “annoying”, particularly as at times treatment itself could already feel quite intensive. Particular remarks were made about the volume of questionnaires service users were expected to complete. It is noted that most of the questionnaires completed by the service users were the routine treatment outcome measures and these were already administered independently from the current study.

3.5. Feasibility Measures

The current study was preliminary in nature, and was not powered \textit{a priori} to detect significant outcomes. One of the main aims of this research was to collect sufficient data to estimate how many participants would be needed to power a larger study. The current study took approximately one year to collect data from 10 participants recruited from three therapy groups. The data collected was used to determine if a larger study would be feasible in terms of the amount of data and resources required.

3.5.1. Soothing variable parameters. With regard to establishing parameters for the soothing variables, there is no accepted general standard for estimating effect sizes and the number of participants needed for mixed modelling analyses (Castello & O’Brien, 2001). One way of calculating effect sizes for mixed models is to calculate the residual variance in a complete mixed model and then compare it to the residual variance of a second version of the model that has the factors of interest removed; this results in an omega squared value (Xu, 2003). For the SDNN change variable, Imagery Task explained 6.1% of the variance, whilst Session explained 16% of the variance. For the transformed RMSSD change variable Imagery Task explained 4.7% of the variance, whilst Session explained 11.9% of the variance. Session also explained 15.2% of the variance in the Social Safeness and Pleasure Scale data. As already observed in the current study, data from 10 participants was sufficient to detect the fixed effect of Session in all of the mixed model analyses. The variance proportions in each of the analyses suggest that a
greater number of participants would be needed to further explore the differing effects of each of the imagery tasks, although it is difficult to accurately estimate the number of participants that would be needed using this approach.

To further determine the number of participants needed, 3 x 3 repeated-measures analyses of variance (ANOVAs) with Session and Imagery Task as repeated factors were carried out for the HRV variables and the Social Safeness and Pleasure Scale data. The resulting partial eta squared values ($\eta^2$) were used to estimate how many participants would be needed to run repeated-measures ANOVAs with an expected power of .8 and an alpha of .05. According to G*Power (Faul et al., 2007) the largest estimated number of participants needed to find a main effect with the given parameters for the soothing variables was 20 participants.

3.5.2. Treatment outcome parameters. The calculated effect sizes suggest that most of the treatment outcome measures were associated with medium-large effect sizes (Cohen, 1992). G*Power (Faul et al., 2007) indicates that to achieve a power of .8 for a one-tailed $t$-test with a medium effect size and an alpha of .05, 27 participants would be needed. This number increases to 62 participants when the alpha is reduced to 0.0017 to take into account multiple comparisons. Of course having enough useable data to power MANOVAs would reduce the number of comparisons needed and control for Type I errors (Huberty & Morris, 1989). Stevens (2009) indicates that for a repeated-measures MANOVA design with measures that have a medium correlation, to achieve a power of .8 with a medium effect size and an alpha of .05, 34 participants are needed.

3.5.3. Overall sample size estimate. The power calculations estimate that approximately 20 participants would be sufficient to detect changes in the soothing variables, whereas 34 participants would be needed for the treatment outcome analyses. These estimates do not account for participant attrition or missing data and so a minimum sample of 40 participants is recommended for future studies. Based on the participation rate of the current study (63%), participants would need to be recruited from approximately 11 therapy groups (based on each therapy group comprising of six service users).
4. Discussion

The current study was a small-scale feasibility study designed to investigate the effect of compassionate imagery on measures of soothing. Participants were recruited from an eating disorder service that ran CFT-E therapy groups. Participants completed a compassionate imagery task at three time points during their treatment programme, and measures of HRV, self-reported social safeness, and self-reported soothing were recorded. To date there has been limited research on the psychophysiological effects of practising compassion and whether it is associated with changes in soothing (Gilbert & Irons, 2004; Rockliff et al., 2008). Previous research investigating physiological changes in response to compassion has primarily used experimental designs with non-clinical populations (Arch et al., 2014; Cosley et al., 2010; Pace et al., 2009; Rockliff et al., 2008). As similar research has not been attempted in a naturalistic setting with a clinical population before, it was important to ascertain whether such a study was possible. The current study therefore aimed to tentatively test the directions of the proposed relationships between compassion, soothing, and treatment outcomes, and to establish if a larger study would be practicable.

4.1. Key Findings

4.1.1. Compassion and HRV. The current findings revealed that compassionate imagery was associated with increased HRV, but this association was only observed at the end of the therapy; during sessions 11 and 15 the HRV parameters demonstrated notable decreases. This pattern of responding suggests that most service users did not experience the imagery exercise as soothing until the end of therapy. Self-regulatory effort is known to result in decreases in HRV (Segerstrom & Solberg Nes, 2007), and it is possible that during sessions 11 and 15 participants were simply expending a lot of effort in order to engage in the imagery task. Alternatively it is possible that service users initially experienced the compassionate imagery task as threatening. Exploring the HRV data on a case-by-case basis revealed that one participant in the current study continued to exhibit a
threat response to the imagery task, albeit to a lesser extent towards the end of therapy.

It has previously been supposed that fears of compassion may interfere with the early stages of therapy (Gilbert et al., 2014). Individuals who are unable to utilise caring or soothing memories can find generating a compassionate image particularly challenging (Gilbert & Irons, 2004), and for some people generating images of compassion is associated with activation of the threat system (Rockliff et al., 2008). It has been suggested that experiencing compassion as soothing can only occur if potential blocks to compassion are identified and adequately addressed (Kelly et al., 2013; Kelly et al., 2014).

4.1.2. Compassion and social safeness. The expectation that practising compassion would be associated with increased social safeness was partially supported by the current findings. At the group level social safeness increased over the sessions, indicating that service users generally perceived their social worlds as more safe, warm, and soothing as they progressed through the treatment programme. Whilst the group-level findings indicated a positive relationship between soothing and social safeness, looking at the individual data revealed that two participants actually experienced a decline in their social safeness despite both demonstrating improvements in relation to their HRV measures. Consequently this indicates that physiological changes indicative of soothing are not necessarily coupled with changes in social safeness.

4.1.3. Compassion and self-reported soothing. Despite positive changes being detected in the HRV and social safeness variables, the session rating scales did not find any significant changes in self-reported soothing. As a result an association between practising compassion and self-reported soothing was not detected. This is in contrast to studies such as Gilbert and Irons (2004) and Gilbert and Procter (2006) where participants found their images to be more powerful, helpful, and soothing over time. It is possible that people with eating disorders find it particularly difficult to use imagery to counteract their self-critical voices, although this explanation is speculative.
4.1.4. **Treatment outcomes.** Even though the current study was not designed to evaluate the effectiveness of the CFT-E programme, changes in the treatment outcome measures were examined. The observed improvements in relation to the CORE-OM, the EDE-Q and the SEDS are consistent with the findings reported by Gale *et al.* (2014). The current findings uphold the claim by Gale *et al.* that CFT-E is an effective treatment for people with eating disorders.

4.1.5. **Treatment outcomes and soothing.** Investigating the data on a case-by-case basis revealed that participants could exhibit opposing changes in the soothing and treatment variables that did not complement one another. The observed relationships between the soothing and treatment outcomes were more complex than proposed, and investigating the links between compassion, soothing, and treatment outcomes would be an interesting area for further research to pursue.

4.1.6. **Acceptability and feasibility.** The measures of acceptability and feasibility suggest that it would be possible to carry out a similar psychophysiological study on a larger scale. In terms of acceptability, participants engaged well with the research, and none of the participants withdrew from the study. Qualitative feedback from the focus group corroborated the acceptability of the study's design. It is acknowledged that missing data from the routine treatment outcome measures was evident, and this highlights the need for clinicians to ensure that routine service data is collected where possible.

The feasibility analyses indicate that extending the current research would be viable. The effect sizes for several of the measures were large enough for the analyses to detect important findings even with a small sample. The current study was not designed to be adequately powered and the primary purpose of the research was to provide estimates of important parameters to inform the design of a larger research study. Based on the current findings it is proposed that a sample of 40 participants would adequately power a similar study (taking into account attrition and completion rates). It is estimated that this would require participants from approximately 11 therapy groups.
4.2. Limitations

The main limitations of the current study pertain to the methodology. The naturalistic design of the study influenced how the HRV data was collected. To ensure that the therapy groups retained their ecological validity, the group sessions were run as usual. Had this been an experimental study it would have been preferential to take baseline HRV recordings, lengthen the time of the imagery exercises to obtain longer recordings, and to counterbalance the different imagery tasks. In addition to the practical aspects of collecting the HRV data, it is noted that whilst HRV provides a useful indicator of PNS activation, this measure does not give a complete physiological picture of what is happening when individuals are generating a compassionate image. First of all, HRV only provides a measure of PNS activation in relation to the heart, and its effects on other bodily systems can only inferred (Ritz, 2009). Secondly, without measures of SNS function it is impossible to ascertain whether the increases in PNS function associated with soothing do in fact down-regulate the activation of the SNS. It has been established that although PNS activation tends to inhibit the SNS, the two systems can in fact be activated in tandem (Berntson et al., 1991). Further research into the physiological affects of compassion would benefit from including measures of both the PNS and SNS, as in the experimental studies by Arch et al. (2014) and Rockliff et al. (2008).

It is noted that whilst the treatment outcome data indicate that many of the participants in the current study exhibited improvements with regard to their eating disorder symptomatology, several participants did not complete both sets of questionnaires. It is possible that the non-completers of the questionnaires were the people who struggled more in therapy and did not improve clinically. Knowing more about these individuals would help us to further explore individual differences in response to compassion and how this relates to changes in treatment outcomes.

Conceptualising the study as a feasibility study meant that it was accepted that the study would be underpowered. The consequence of this was the likelihood that several of the analyses would miss important effects if the changes observed in the measures were small i.e., Type II errors would occur. Steps were taken
during the analyses to ensure that important findings were not overlooked, although certain procedures may have increased the possibility of Type I errors (for example not correcting the \( t \)-test significance values for multiple comparisons). It goes without saying that a larger sample would be needed to power a study to address these issues, which was beyond the scope of the current research.

4.3. Strengths

To our knowledge, this is the first study to explore whether compassionate imagery is associated with psychophysiological changes in a clinical population. Whilst compassion is proposed to increase feelings of safety and contentment by activating the soothing system (Gilbert, 2010), this theory has not been well researched in relation to CFT treatment programmes. The study used a naturalistic design, in order to increase ecological validity, and several measures of soothing were included to maximise the possibility that effects would be detected. The use of an objective physiological measure alongside standardised self-report measures overcomes some of the biases that are inherent in self-report measures. The use of more than one component of HRV also added to our understanding of how compassion affects the body. Rockliff et al. (2008) had previously reported that compassionate imagery was associated with changes in a global measure of HRV (the SDNN) in a non-clinical sample. The current study also analysed changes in the RMSSD HRV metric. The findings indicate that compassionate imagery is not just associated with changes in global HRV, but is also associated with increases in the component of HRV associated with the PNS. This finding lends support to Gilbert’s (2010) belief that compassion is coupled with activation of a neurobiological system that is associated with soothing.

4.4. Research Implications

As the current study was a small-scale feasibility study, the findings do not adequately address some of the assumptions from Gilbert’s (2010) model of compassion. Evidence is accumulating in relation to effectiveness of CFT (for a
review see Leaviss & Uttley, 2015), but the mechanisms underlying the CFT approach remain hidden. Studies evaluating CFT treatment programmes have suggested a greater need for randomised controlled trials, however it is important to also continue exploring how compassion works using alternative approaches and methodologies.

The current research recruited participants from a CFT treatment programme adapted for people with eating disorders, but the findings may also be relevant for other CFT treatment programmes. CFT treatments were initially designed to be transdiagnostic and it is possible that disorder-specific adaptations that improve outcomes may also enhance CFT programmes designed for other clinical populations. Whilst research into compassion may focus on a particular population, it is important to remember that the findings may have widespread implications.

The current study highlights several avenues for future research. The acceptability and feasibility findings indicate that it is possible to carry out psychophysiological studies in naturalistic treatment settings; in this case the research was undertaken within a CFT treatment programme for people with eating disorders. The data from the current study provides estimated parameters that can be used to inform the design of larger studies to ensure they are adequately powered. It is hoped that the current research will encourage other researchers to consider using different measures of soothing and compassion to address the question of whether compassion does indeed increase soothing and impact on treatment outcomes.

4.5. Clinical Implications

A key finding of the current study is that positive changes in soothing can take time to materialise. This is not surprising, as research has shown that fears of compassion are likely to impede treatment responses (Gilbert et al., 2014; Kelly et al., 2013). Part of the CFT-E treatment programme focuses on helping individuals to work through their fears and blocks to self-compassion in order to help them activate their soothing system without also activating their threat system (Goss &
Allan, 2014). This is an important therapeutic practice for all compassion focused therapies.

If further research confirms that compassionate imagery is associated with physiological indices of soothing, clinicians may consider using HRV biofeedback as a clinical tool. This technique can be used to help service users to attune to their bodily responses, and help them to develop a greater understanding of whether they are responding to compassion in a manner that is soothing or threatening. Whilst Gilbert (2010) argues that compassion should result in increased soothing, when individuals have limited experiences of soothing, compassion is difficult to generate and tolerate (Gilbert & Irons, 2004). It is important to remember that for some service users compassion will be less about experiencing a state of soothing and more about simply reducing distress. Biofeedback may help service users to appreciate that they are making progress, even when practising compassion continues to seem difficult. Over time practise may increase an individual’s ability to experience compassion as soothing, although this may be difficult to maintain once therapy ends.

4.6. Conclusion

The current study is one of the first to explore whether compassionate imagery is associated with measurable psychophysiological changes in a clinical population. The findings provide preliminary evidence that indicates that practising compassion is associated with psychophysiological changes that are akin to soothing, but these changes may only be observable towards the end of therapy. Not everyone experiences compassion as soothing, and it is important to continue exploring individual differences in compassion responses. The current study has demonstrated that it is viable to measure the effects of compassion on soothing variables within a CFT treatment programme. It is hoped that the current findings will be used to inform the design of larger studies that would extend this research.
References


Critical Appraisal
1. Introduction

As part of the research process a reflective journal was kept. Throughout the research I often thought about epistemological, theoretical, and methodological issues. Many of my reflections also captured my experience of doing research as a part of a professional doctoral training course. The critical appraisal provides a summary of some of the main reflections that arose.

2. Epistemological Issues

The research questions that motivated the current research resulted in designs that were primarily quantitative in nature. It was assumed that soothing and compassion are not only observable phenomena, but they are also quantifiable through scientific measurement. This approach was considered appropriate for the literature review, as most of the existing evidence has utilised quantitative methodologies to explore compassion. A quantitative approach was therefore compatible with the body of evidence being reviewed. The empirical paper was interested in the effect of compassion on soothing, and whilst a qualitative approach could have been adopted the decision was made to use heart rate variability to index the activation of the parasympathetic nervous system. This was based on the premise that changes in heart rate variability indicate whether or not an individual is in a state of self-soothing or threat (Porges, 2007). The use of an objective physiological measure raised important epistemological questions about the use of biological indices to measure psychological phenomena.

Psychology and psychophysiology have similar goals of wanting to explain human experience and behaviour (Cacioppo et al., 2007). The main difference between the two disciples is the methodology used to measure psychological phenomena. Psychophysiological approaches assume that the body is able to tell us something about the mind, and psychophysiologists reject the distinction between the mind and the body (Blascovich, 2000). It would be contentious to think that human behaviour can simply be reduced to physiological processes, and overly simplistic to reason that this is what psychophysiological research does. Psychophysiological studies aim to increase our understanding of the
correspondence between various physiological processes and psychological phenomena in order to further understand how we respond and adapt to our environments. The findings from psychophysiological research is relevant to clinical psychology because they can help us understand how the mind and the body influence each other and shape the way we think, feel, and behave. This is the premise of most mind–body therapies, and many of the practices within compassion focused treatment programmes emphasise mind–body links (e.g., using compassion to turn on the soothing system). As a result psychophysiological approaches are appropriate when trying to conceptualise and research compassion.

3. Methodological Issues

Whilst methodological advancements are making it possible for researchers to link physiological systems with psychological processes with more certainty, there is a need to appreciate the limitations of such approaches. In the current empirical study heart rate variability was used as a measure indicative of ‘soothing’. The heart monitors measured heart rate as well as the beat-to-beat changes in the heart’s rhythm that were used to calculate heart rate variability. Heart rate on its own is an inadequate measure of autonomic function because it is influenced by both the sympathetic and parasympathetic nervous systems (Jänig, 2006); components of heart rate variability on the other hand can directly index the activation of the parasympathetic nervous system (Cacioppo et al., 1994; Task Force, 1996). Whilst heart rate variability is generally accepted as a measure of parasympathetic nervous system activation (Porges, 2007), heart rate variability as a physiological measure is not without its complications. First of all heart rate variability is only a measure of parasympathetic nervous system activation on the heart. Whilst the effects of the parasympathetic nervous system are generally thought to be fairly widespread, studies have shown that the parasympathetic nervous system can have very localised and specific effects on different parts of the body (Jänig, 2006). As a result measuring heart rate variability provides an indicator of parasympathetic nervous system activation on the heart, but it tells us very little about its effect on the rest of the body (Ritz, 2009).
A further consideration is that whilst measuring heart rate variability may tell us something about the activation of the parasympathetic nervous system, it tells us very little about the activation of the sympathetic nervous system. Historically the sympathetic and parasympathetic nervous systems were conceptualised as two antagonistic systems, the former stimulated the body whilst the latter calmed the body down (Cannon, 1929). Nowadays it is accepted that the systems are independent of one another and can be co-activated, uncoupled, or reciprocal in their effects (Berntson et al., 1991). Therefore whilst measuring heart rate variability means that we can supposedly measure activation of the parasympathetic nervous system, we cannot assume that the sympathetic nervous system is responding in a predictable fashion. Measuring one system and not the other only tells part of the story in terms of peripheral nervous system activity, and even less when we consider that even measures of sympathetic and parasympathetic nervous system activation still do not accurately capture central nervous system activation, or endocrinologic and immunologic processes (Cacioppo et al., 2007).

As advances in methodological approaches occur it is anticipated that researchers will be able to address some of these issues to get a better understanding of what goes on in the mind and body when people are being compassionate. It is hoped that this knowledge will be able to help inform therapeutic practices to maximise the treatment outcomes that are supposedly associated with compassion and the ability to self-soothe. In the meantime the service where I carried out the empirical research are keen to continue exploring the psychophysiological effects of compassion. There is the possibility that funding will be obtained to extend the current research, and it will be interesting to see whether or not the current findings are supported.

4. Theoretical Issues

The contents of this thesis were largely focused on Gilbert’s (2010) model of compassion. This model has its roots in several fields, including attachment, evolutionary psychology, and neurobiology. The model takes a functional approach and suggests that compassion and self-soothing are emergent properties of the
neurobiological system that underpins feelings of contentment and safety. Compassion and the ability to self-soothe are socialised through our primary caregivers, and through exposure and practise these abilities become internalised (Gilbert, 2010). The ability to be compassionate towards oneself results in a capacity for self-soothing when distressed. Individuals who have limited experiences of soothing and compassion supposedly find it different to generate and tolerate feelings of compassion (Gilbert & Irons, 2004; Gilbert et al., 2014). All is not lost though, compassion is thought to be a capacity that can be nurtured and developed, meaning that deficiencies in soothing in one’s early life can be repaired for.

It is important to think about what we mean when we talk about ‘compassion’ and ‘soothing’. It was assumed that we could conceptualise and accurately measure these as variables, but questions have previously been raised in terms of what it means to be compassionate and how compassion can be best measured (MacBeth & Gumley, 2012; Mayhew & Gilbert, 2008; Neff, 2003). In the current study multiple measures thought to reflect the activation of the soothing system were included, but the findings revealed discrepancies between the measures. Changes in heart rate variability did not always correspond to changes in self-reported social safeness, and the session rating scales failed to find any significant changes in self-reported self-soothing. The current empirical paper was designed as a small-scale feasibility study and so the findings are only tentative. With this in mind however, the reported findings do raise some important questions about some of the assumptions made in relation to CFT.

It is important to remember that Gilbert’s (2010) model of compassion is theoretical. Whilst compassion focused therapy (CFT) is becoming a very popular therapeutic approach, there is very little empirical evidence actually testing the tenets of Gilbert’s theory. Most of the CFT research that has been published either has Gilbert as a co-author, or the evidence is from CFT treatment programmes run by Gilbert’s protégés. CFT practices are embedded with treatment protocols borrowed from other therapeutic approaches, and the lack of randomised control trials comparing CFT with other therapies means that it’s impossible to identify the treatment outcomes that are unique to the CFT. The evidence base is
intrinsically biased and more independent research is needed to test the validity of Gilbert’s claims as well as the effectiveness of CFT.

5. The Research Journey

5.1. First Year

My research journey first began early on in training when we had research presentations from potential supervisors offering ideas for a range of research projects. The process for choosing a project involved meeting with potential supervisors and discussing ideas for research questions. I met my research supervisors in the first couple of months of training and it was quickly established that a project looking at compassion would be practicable. Our research preferences were confirmed by the course in the January of first year and several meetings were had to think about the study design. We had a deadline in May to put together a research proposal for review by the course team. At the time it felt like this was early on in training, but in hindsight the research planning needed to start as soon as possible.

When I first started the research project I had some knowledge of Gilbert’s (2010) model of compassion. Prior to training I had completed a research degree using psychophysiological methods and so I had a fairly good understanding of the methodologies that could be used to measure autonomic functioning. Although I had some awareness of Gilbert’s theory, I had not previously focused on the clinical application of trying to enhance the activation of the parasympathetic nervous system. Increased heart rate variability has been linked to psychological and physiological wellbeing (Kashdan & Rottenberg, 2010; Kok & Fredrickson, 2010; Porges, 2007) but therapeutic approaches do not tend to make established links between the mind and the body so explicit. Research was emerging to link soothing and compassion with the activation of the parasympathetic nervous system (e.g., Rockliff et al., 2008), but these findings had not really been translated into practice.

After planning my research question I had to think about the best way of collecting the data. Feedback from current service users confirmed that they would
feel happier doing the research in the therapy group, so I needed to think about how I could maximise the amount of data I could collect in each session. The best way of achieving this was to use portable heart rate monitors. My research budget from the course covered the cost of one heart rate monitor, and so if I wanted to extend my data collection I needed to look at other options. I originally tried to contact other departments in the university to look at whether I could borrow any equipment, but in the end I contacted the Compassionate Mind Foundation as I was informed that they might be able to help fund the project. After writing a short application they agreed to fund the heart rate monitors as long as they were available for other projects to use once I had finished my research. The success of this funding application was a huge gain, as it meant that I had enough heart rate monitors so that I could collect data from up to ten participants at a time! Although I was no longer limited by the number of heart rate monitors I still had no indication of whether service users would consent to take part in such a study. Asking people with eating disorders to wear devices on their bodies may been perceived as intrusive, which may have meant that no one wanted to participate. The possibility that the study might come to nothing because people would not opt in was quite unsettling.

The proposal for the research project went for peer review towards the end of the first year of training. This process helped me to think about the scope of the project and the likely obstacles I was going to face when applying for ethical approval. I found the support from the reviewers encouraging and I began to firm up the proposal so I could apply for NHS ethics. This was the first time I had applied for NHS ethical approval and the task was somewhat daunting. My supervisors had traversed this process before, but because this area of research was new to them and I was leading the project the responsibility of applying for ethical approval was down to me. The ethics process required me to specify what data would be collected, how this would be done, who would be involved, and any whether there were any risks associated with this. At times I needed to ask for advice, whether it be from my supervisors or the research and development (R&D) teams involved. Networking with the R&D teams was really valuable and it helped to clarify the ethics process and I managed to get through without too many setbacks.
5.2. Second Year

I submitted my documentation to the ethics committee just before Christmas of second year and the research ethics committee (REC) meeting took place in the February. The wait for the REC meeting seemed to take forever and I was glad that I did not have to wait any longer for the favourable opinion. At the REC meeting I was supported by one of my research supervisors, but I managed to answer most of the REC’s questions independently. Most of the questions regarded my experience of carrying out similar research and the recommendations were mainly about the wording of the participant information sheets and consent forms.

As soon as I had my favourable opinion and the R&D approval my project was ready to go. The staff at the eating disorders service were helpful in supporting the project, particularly in terms of recruitment. The timing of the project’s approval coincided with the psychoeducation phase of a CFT-E treatment group and so I did not have to wait long to start my data collection. Out of the six service users attending the first therapy group all of them consented to the equipment demonstrations and following these gave consent to take part in the research. I was encouraged as this was 100% uptake, although before the recovery phase of the group two service users were excluded from treatment for clinical reasons. This loss of participants was disappointing, but as this was early on in the project I still felt confident that I would be able to recruit more participants from additional therapy groups.

Data collection from the first group went relatively smoothly. The heart rate monitors were simple to set up and once the participants had worn them in a session they were able to set themselves up without too much support. A couple of times the heart rate monitors were temperamental and did not immediately detect the heart rate, but this always seemed to resolve in time for data collection to go ahead. When things did not go right straight away I felt very pressured, as I knew that losing data could be quite significant in terms of being able to provide reliable parameter estimates for a larger study. During the early stages of the study there was no way of knowing how many service users would consent to take part, and so data collection was carried out with some trepidation. This fear somewhat
lessened after the focus group was completed. Although only two participants were available to talk to me, their comments were encouraging and they reassured me that the project was acceptable and they did not point out any obvious flaws with the study design.

A disappointment arose when I came to recruit from the second therapy group. Out of the six service users in the group, only person expressed an interest in taking part in the study. Whilst I was happy that I had increased my sample size I had expected a similar response to the first group. The clinicians at the service later reflected that the group dynamic felt different to other therapy groups and they had also been surprised at the lack of uptake. It was helpful having the support of the clinicians at the service as they kept me updated about the timing of the groups and they often liaised on my behalf with the participants about when I would be coming to the service to collect data.

There was a pause over the summer in between second and third year whilst I waited to hear if another therapy group would be completed in time for the research project. It was possible that delays in data collection could occur due to a reconfiguration of local services. The uncertainty relating to this meant that it was difficult for the clinicians at the service to plan another therapy group and so there were a couple of months where I did not collect any data. This pause in data collection was spent working on the literature review for the thesis. I was glad to have this space to concentrate on the thesis write up, but in the back of my mind I was constantly aware of the possibility that I may have finished my data collection.

The literature review took several months to write and was conducted simultaneously to the data collection for the empirical study. Scoping searches were initially conducted to help me decide on a research question and this made me realise the need for a clear focus. I had originally hoped to look at the literature linking shame and self-criticism to compassion in eating disorders, but there were very few studies that looked at these relationships directly. In the end I chose to focus on the treatment outcomes associated with compassion focused therapies. Trawling through the literature and narrowing down my search terms was a drawn out task, but once I had my final selection of studies it was really motivating to look through the findings and think about how they related to my own empirical study. The literature review helped me to contextualise my empirical paper, and
made me think critically about some of the issues associated with researching compassion and compassion focused therapies.

I was surprised when I came across the review by Leaviss and Uttley (2015) that was made available online ahead of publication at the end of 2014. By this time I had a full draft of my literature review and I was concerned that this review would make my own redundant. Thankfully, whilst my review addressed a similar question it approached it from a different angle. My literature review was specifically focused on treatment outcomes with clinical populations, and my findings seemed to complement the results from the Leaviss and Uttley paper rather than replicating them.

5.3. Third Year

It was not long after third year started that I received confirmation that another therapy group would be completed before my research project was due to finish. The challenge was that this last group was not due to take place until the end of the year. I decided to take a chance and we went ahead with recruitment. To my surprise five out of six of the service users consented to the equipment demonstrations and all of them consented to take part in the study. I felt less pressured about the amount of data I was likely to obtain but was wary that this depended on data collection finishing before I had to submit my thesis.

Data collection from the last group started in November of third year, and due to the Christmas break the final recording session did not take place until February. My original timeline for the research had estimated that I would have my data by Christmas and so the situation was less than ideal. I had planned four months to write up the findings from the research project, but if I wanted my sample of 10 participants I had to wait until the final group was finished. This required a lot of patience. I was fortunate that during this time that I did manage to attend a three-day workshop on CFT that helped me to think back to the early days of the research project and where the research had stemmed from.

The final hurdle for the research project was analysing my data. I had spoken to a statistician who had introduced me to the option of using mixed modelling analyses. This analysis approach seemed a much better fit with my data
than multivariate analyses of variance. Even with support, understanding the potential of mixed models and the best way to carry out and interpret the findings was a steep learning curve. At the beginning of the research project I felt quite confident in my research capabilities, as I was doing something familiar, but every step of the way I have found a new challenge. The main remaining challenge now is to make sure that the findings from the project are adequately disseminated. This is something I hope to achieve now that the findings have been collated.

6. Personal Reflections

Prior to training I had already developed an interest in compassion and I was excited to be able to explore this concept further through my DClinPsy research. My previous research experience using psychophysiological methodologies fitted well with the emerging research on compassion and its effects on the body, and so after meeting with my research supervisors the research project quickly took shape. Whilst heart rate variability was something I had grappled with before, I had previously used a different methodology. This meant that the current research presented several new challenges for me. I found the experience of carrying out real-world research in the NHS very different from the controlled experiments I had previously carried out in a university laboratory. I didn’t have the technical support that had previously been available to me and the service users who offered to participate were much more valuable than the endless undergraduate students who had previously participated in my research studies for course credits. I had to rely on service users offering to take part and I was not able to simply expand recruitment to increase my sample size, which was often something I grappled with. I also needed to work alongside the clinicians at the eating disorder service, who were focused on the clinical aspects of the therapy group whilst I tried to collect my data alongside them. As I was not based at the service I relied on them to arrange the groups, help me recruit participants, and collect the routine data. This meant that there were aspects of the study that I had very little control over. Appreciating the limitations of the research was difficult, and I frequently had to remind myself that whilst my research was aiming to be
doctoral-level it was not going to be equivalent to that of a full-time postgraduate research degree.

Conducting research alongside my other training commitments was probably the biggest challenge faced. Initially my research supervisors had hoped that I would be able to complete a clinical placement at the eating disorder service where the data collection was taking place. This would have meant that I would have been onsite to collect my data for at least 6 months, if not a year. For several reasons the placement arrangements did not work out which meant that collecting data was time-intensive. Both the university and my placements were an hour away by car and so two hours of data collection often took up the best part of a day. When data collection conflicted with other aspects of training this had to be negotiated, and it was difficult to prioritise one aspect of training over another. At times juggling my research and training commitments was frustrating, and trying to organise my time across different NHS services that were unpredictable could feel overwhelming. Trying to navigate the systems across different NHS Trusts was also challenging and I frequently had to go back and forth to ensure I had the right access and authorisations to be able to collect my data at the service.

An advantage of being outside of the service was that I was able to maintain some independence, which opened my eyes to the some of the biases inherent to the project. The findings of the study had the potential to either support or undermine the some of the main tenets of CFT, which is the basis of one of the service’s main treatment programmes. In addition to this, the Compassionate Mind Foundation funded the heart rate monitors and this could also be considered a source of bias. It was important for me to recognise these conflicts of interest and think about how my own subjectivities may have influenced the way I conducted the research. Whilst my supervisors were keen to understand more about the relationships between compassion and soothing they constantly reminded me that this project was more about feasibility rather than hypothesis testing. Throughout the research I had to keep in mind that I was not aiming to find effects, and this helped me to feel less pressured about whether the results would show anything significant. Thinking about these issues made me realise how important it is for clinical psychologists to be reflective about every aspect of their role, not just their clinical work.
In an ideal world I would have liked more clinical experience actually working with the CFT approach. Whilst I have attended two 3-day workshops on CFT during my clinical training, I have limited experience of using this approach with service users. Greater clinical experience of CFT may affect my subjective stance, but it might also help me think in greater detail about the CFT treatment programme and how different CFT practices might be best used and subsequently evaluated. With this in mind, it is important for clinical psychologists embrace their roles as scientist–practitioners in order to be in a good position to make theory–practice links.
References


Appendix A: Search Keywords and Database Parameters

Table A.1. Search keywords

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<tr>
<th>Compassion</th>
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<th>Psychopathology</th>
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Table A.2. Database parameters

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²Although guilt is not synonymous with shame, it was included as a search term because historically publications have used these terms interchangeably (Gilbert et al., 1994; Tangney et al., 1996).
Appendix B: Flow of Studies Included in Literature Review

Potential articles identified via electronic database searches \((n = 1277)\) → Duplicates removed \((n = 356)\)

Article titles and abstracts retrieved \((n = 921)\) → Articles excluded for irrelevance \((n = 808)\)

Relevant articles retrieved from database \((n = 113)\)

Articles excluded due to not meeting criteria \((n = 102)\)
- Correlational: 30
- Non-clinical sample: 21
- Theoretical: 19
- Non-CFT\(^3\) intervention: 15
- No standardised measures: 6
- Brief intervention: 4
- Review paper: 4
- Non-adult sample: 3

Articles shortlisted for quality appraisal \((n = 11)\)

References searched for further articles \((n = 1)\)

Articles included in the review \((n = 11)\)

Articles excluded due to quality appraisal \((n = 1)\)

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Figure B.1. Diagram of the article selection process

\(^3\)CFT = compassion focused therapy
Appendix C: Crowe Critical Appraisal Tool (Crowe, 2013)

### Crowe Critical Appraisal Tool (CCAT) Form (v1.4)

**Citation**

<table>
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<th>Reviewer</th>
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**Research design (add if not stated)**

- Not research
- Article | Editorial | Report | Opinion | Guideline | Pamphlet |
- Historical
- Qualitative | Narrative | Phenomenology | Ethnography | Grounded theory | Narrative case study |
- Descriptive, Exploratory, Observational | A. Cross-sectional | Longitudinal | Retrospective | Prospective | Correlational | Predictive |
- B. Cohort | Case-control | Survey | Developmental | Normative | Case study |
- Experimental | Q. True experiment | Pre-test/post-test control group | Solomon four-group | Post-test only control group | Randomised two-factor |
- Q. Quasi-experiment | Post-test only | Non-equivalent control group | Counter-balanced (cross-over) | Multiple time series |
- Q. Single system | Separate sample pre-test/post-test [no Control] | Multiple baseline |
- Mixed Methods | Action research | Sequential | Concurrent | Transformative |
- Synthesis | Systematic review | Critical review | Thematic synthesis | Meta-ethnography | Narrative synthesis |
- Other

**Variables and analysis**

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<th>Group 3</th>
<th>Group 4</th>
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**Population, sample, setting**

**Data collection tool used**

- Audit/Review
  - a) Primary | Secondary
  - b) Authoritative | Partisan | Antagonist
  - c) Literature | Systematic
- Observation
  - a) Participant | Non-participant
  - b) Structured | Semi-structured | Unstructured
  - c) Covert | Credid

**Scores**

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**Introduction**

| Sampling | Ethical Matters | Discussion | Total [9] |

**General notes**

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Appendix C: Crowe Critical Appraisal Tool (Crowe, 2013)

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<td>2. Precise details of the intervention(s)/treatment(s)/exposure(s) for each group</td>
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<td>Bias, etc</td>
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<td>1. Potential bias, confounding variables, effect modifiers, interactions</td>
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<td>3. Equivalent treatment of participants/cases/groups</td>
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<td>4. Sampling</td>
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<td>Sampling [5/5]</td>
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<td>5. Data collection</td>
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<td>3. Manage non-participation, withdrawal, incomplete data</td>
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<td>Data collection [5/5]</td>
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<td>6. Ethical matters</td>
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<td>Ethical matters [5/5]</td>
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<td>7. Results</td>
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<td>Analysis, Integration, Interpretation method</td>
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<td>3. Suitability of analysis/Integration/Interpretation method(s)</td>
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<td>Essential analysis</td>
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<td>2. Demographic and other characteristics of participants/cases/groups</td>
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<td>3. Analyse raw data, response rate, non-participation/withdrawal/incomplete data</td>
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<td>Outcome, Output,</td>
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<td>Outcome/Output, Predictor analysis</td>
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<td>1. Summary of results and precision for each outcome/output/predictor/mode</td>
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<td>2. Consideration of benefits/harms, unexpected results, problems/failures</td>
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<td>3. Description of outlying data (e.g. diverse cases, adverse effects, minor themes)</td>
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<td>Results [5/5]</td>
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<td>8. Discussion</td>
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<td>Interpretation</td>
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<td>1. Interpretation of results in the context of current evidence and objectives</td>
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<td>2. Draw inferences consistent with the strength of the data</td>
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<td>3. Consideration of alternative explanations for observed results</td>
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<td>4. Account for bias, confounding effect modifiers/interaction/imprecision</td>
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<td>1. Consideration of overall practical usefulness of the study</td>
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<td>Concluding remarks</td>
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<td>2. Description of generalisability (external validity) of the study</td>
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<td>1. Highlight study’s particular strengths</td>
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<td>2. Suggest steps that may improve future results (e.g. limitations)</td>
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<td>3. Suggest further studies</td>
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### Appendix D: Studies Included in the Literature Review

Table D.1.

Studies included in the literature review

<table>
<thead>
<tr>
<th>No.</th>
<th>Authors</th>
<th>Title</th>
<th>Population</th>
<th>Intervention</th>
<th>Comparison Group</th>
<th>Measures and Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ashworth et al. (2011)</td>
<td>Compassion focused therapy after traumatic brain injury: Theoretical foundations and a case illustration</td>
<td>Acquired brain injury case study ($n = 1$)</td>
<td>6 individual sessions of CBT followed by 18 individual sessions of CFT (within a neurorehabilitation programme)</td>
<td>None</td>
<td>Measures: Beck Anxiety Inventory; Beck Depression Inventory; Self-Concept Questionnaire; State-Trait Anger Expression Inventory. Outcome: Improvements were seen across all of the measures</td>
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<td>Preliminaries</td>
<td>Design</td>
<td>Data Collection</td>
<td>Results</td>
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<tr>
<td></td>
<td>Introduction</td>
<td>Design</td>
<td>Data Collection</td>
<td>Results</td>
<td>4/5</td>
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<td>Sampling</td>
<td>Ethical Matters</td>
<td>Results</td>
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<tr>
<td>2.</td>
<td>Ashworth et al. (2014)</td>
<td>An exploration of compassion focused therapy following acquired brain injury</td>
<td>Acquired brain injury sample ($n = 12$)</td>
<td>4 days of group sessions with up to 18 individual sessions of CFT (within a neurorehabilitation programme)</td>
<td>None</td>
<td>Measures: Hospital Anxiety and Depression Scale; Forms of the Self-Criticizing/Attacking Scale; Semi-structured interview. Outcome: Improvements were found on all of the measures and subscales. The emerging themes from the qualitative data supported the quantitative findings</td>
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<tr>
<td>3.</td>
<td>Beaumont et al. (2012)</td>
<td>'Being kinder to myself': A prospective comparative study, exploring post-trauma therapy outcome measures, for two groups of clients, receiving either cognitive behaviour therapy or cognitive behaviour therapy and compassionate mind training</td>
<td>Trauma victims ($n = 16$)</td>
<td>12 individual sessions of CBT plus CMT</td>
<td>Trauma victims receiving 12 individual sessions of CBT ($n = 16$)</td>
<td>Measures: Hospital Anxiety and Depression Scale; Impact of Events Scale; the Self-Compassion Scale. Outcome: Both groups experienced reductions in anxiety, depression, avoidant behaviour, intrusive thoughts and hyper-arousal symptoms. The CMT group demonstrated higher self-compassion scores post-therapy</td>
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Note: CBT = cognitive behaviour therapy; CFT = compassion focused therapy; CMT = compassionate mind training; RCT = randomised controlled trial; TAU = treatment as usual
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<table>
<thead>
<tr>
<th>No.</th>
<th>Authors</th>
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<th>Comparison Group</th>
<th>Measures and Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Braehler et al. (2013)</td>
<td>Exploring change processes in compassion focused therapy in psychosis</td>
<td>Adults with schizophrenia spectrum disorder (n = 22)</td>
<td>16 group sessions of CFT with TAU (including medication, contact with a psychiatrist and/or community psychiatric nurse, occupational therapy and day centre support)</td>
<td>RCT: Individuals receiving TAU (n = 18)</td>
<td>Measures: Clinical Global Impression Scale; Narrative Recovery Style. Outcome: CFT was associated with greater observed clinical improvement and significant increases in compassion.</td>
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</tbody>
</table>

| Preliminaries | 5/5 | Design | 4/5 | Data Collection | 5/5 | Results | 3/5 |
| Introduction | 5/5 | Sampling | 4/5 | Ethical Matters | 5/5 | Discussion | 5/5 |

| 5. | Gale et al. (2014) | An evaluation of the impact of introducing compassion focused therapy to a standard treatment programme for people with eating disorders | Eating disorder populations (n = 99) | Psycho-education, followed by 20 group sessions of CFT | None | Measures: Eating Disorder Examination Questionnaire; Stirling Eating Disorder Scale; Clinical Outcomes in Routine Evaluation. Outcome: In general all of the measures showed significant improvement – people with bulimia nervosa particularly seem to benefit |

| Preliminaries | 4/5 | Design | 4/5 | Data Collection | 5/5 | Results | 5/5 |
| Introduction | 5/5 | Sampling | 4/5 | Ethical Matters | 4/5 | Discussion | 5/5 |

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<tbody>
<tr>
<td>6.</td>
<td>Gilbert &amp; Procter (2006)</td>
<td>Compassionate mind training for people with high shame and self-criticism: Overview and pilot study of a group therapy approach</td>
<td>Patients attending a cognitive-behavioural day centre ( (n = 6) )</td>
<td>12 sessions of group CMT</td>
<td>None</td>
<td>Measures: Hospital Anxiety and Depression Scale; Diary records and qualitative ratings of self-criticism; Functions of the Self-Criticizing/Attacking Scale; Forms of the Self-Criticizing/Attacking Scale; Other as Shamer Scale; Social Comparison Scale; Submissive Behaviour Scale. Outcome: Participants showed significant reductions in depression, anxiety, self-criticism, shame, inferiority and submissive behaviour. There was also a significant increase in the participants’ ability to be self-soothing</td>
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| Preliminaries | 5/5 | Design | 4/5 | Data Collection | 5/5 | Results | 3/5 |
| Preliminaries | 4/5 | Design | 4/5 | Data Collection | 5/5 | Results | 4/5 |
| Introduction | 5/5 | Sampling | 5/5 | Ethical Matters | 4/5 | Discussion | 5/5 |

### 7. Judge et al. (2012)

An exploration of group-based compassion focused therapy for a heterogeneous range of clients presenting to a community mental health team

| Clients with severe and enduring mental health difficulties \( (n = 27) \) | 12-14 weeks of group CFT | None | Measures: Beck Depression Inventory; Beck Anxiety Inventory; Forms of Self-Criticising/Attacking and Self-Reassuring Scale; Functions of Self-Criticising/Attacking Scale; Internalized Shame Scale; Other as Shamer Scale; Social Comparison Scale; Submissive Behaviour Scale; Weekly diary of self-attacking and self-soothing. Outcome: Significant reductions were found for depression, anxiety, stress, self-criticism, shame, submissive behaviour, and social comparison |

| Preliminaries | 4/5 | Design | 4/5 | Data Collection | 5/5 | Results | 4/5 |
| Preliminaries | 4/5 | Design | 4/5 | Data Collection | 5/5 | Results | 4/5 |
| Introduction | 4/5 | Sampling | 4/5 | Ethical Matters | 4/5 | Discussion | 4/5 |

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<th>Comparison Group</th>
<th>Measures and Outcome</th>
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<tbody>
<tr>
<td>8.</td>
<td>Laithwaite et al. (2009)</td>
<td>Recovery after psychosis (RAP): A compassion focused programme for individuals residing in high security settings</td>
<td>Adults with schizophrenia spectrum disorder (n = 18)</td>
<td>20 group sessions of Recovery After Psychosis programme (based on CMT)</td>
<td>None</td>
<td>Measures: Social Comparison Scale; Other as Shamer Scale; Beck Depression Inventory; Rosenberg Self-Esteem Measure; Self-Image Profile for Adults; Positive and Negative Syndrome Scale. Outcome: Significant improvements were found on several of the scales (not self-compassion, self-concept or self-image)</td>
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Preliminaries | Design | Data Collection | Results | Discussion |
--- | --- | --- | --- | --- |
Introduction | 5/5 | 4/5 | 5/5 | 5/5 |

| 9.  | Lucre & Corten (2013)    | An exploration of group-based compassion-focused therapy for personality disorders | Personality disorder sample (n = 8) | 16 weeks of group CFT | None             | Measures: Other as Shamer Scale; Social Comparison Scale; Submissive Behaviour Scale; Self-Attacking and Self-Reassuring Scale; Depression Anxiety and Stress Scale; Clinical Outcomes in Routine Evaluation. Outcome: In general most of the measures showed significant improvement (not inadequate self of FSCRS, submissive behaviour or anxiety) – many of these were maintained at 1-year follow-up. |

Preliminaries | Design | Data Collection | Results | Discussion |
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Introduction | 5/5 | 4/5 | 5/5 | 4/5 |

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<tbody>
<tr>
<td>10.</td>
<td>Mayhew &amp; Gilbert (2008)</td>
<td>Compassionate mind training with people who hear malevolent voices: A case series report</td>
<td>Case series of individuals with auditory hallucinations (n = 3)</td>
<td>12 individual sessions of CMT</td>
<td>None</td>
<td>Measures: Belief About Voices Questionnaire; Forms of Criticism/Attacking and Self-Reassuring Scale; Functions of Self-Criticism/Attacking and Self-Reassuring Scale; Symptom Checklist-90; Voice Rank Scale; Self-Compassion Scale; Weekly diary. Outcome: Results showed decreases in depression, psychoticism, anxiety, paranoia, obsessive–compulsive disorder and interpersonal sensitivity</td>
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<td>Preliminaries Design                                                                                   Data Collection 5/5 Results                                                                                          Discussion 3/5</td>
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<td>11.</td>
<td>Stewart &amp; Holland (2011)</td>
<td>Trainee clinical psychologists’ experience of facilitating a compassionate mind training group for people with mental health difficulties</td>
<td>Case series of adults with mental health difficulties (n = 4)</td>
<td>14-week group CMT</td>
<td>None</td>
<td>Measures: General Anxiety Disorder Scale; Public Health Questionnaire, Self Compassion Scale; Forms of Self Criticising and Self Reassuring Scale. Outcome: Participants demonstrated reductions in self-criticism and self-attacking, and an increase in self-compassion. Three participants also demonstrated reductions in anxiety and depression</td>
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<td>Preliminaries Design                                                                                   Data Collection 4/5 Results                                                                                          Discussion 2/5</td>
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</tbody>
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Appendix E: Participant Invitation, Information and Consent Forms

Participant Invitation

An exploration of heart rate variability reactivity in response to Compassion Focused Therapy for people with eating disorders: A feasibility study

Name of Researcher:
Contact:

Thank you for considering to take part in the study An exploration of heart rate variability reactivity in response to Compassion Focused Therapy for people with eating disorders: A feasibility study. Please find attached an information sheet which explains the study in detail.

If you would like to participate in the study or wish to discuss it further please fill in your details and sign the slip below and hand this to a member of staff. Alternatively you can contact the lead researcher directly via the email address below.

If you do not wish to participate this will not affect your treatment at.

Thank you for your interest.

Kind regards

I,___________________________ (insert name) agree to being contacted on ______________________ (insert contact telephone number) regarding the study An exploration of heart rate variability reactivity in response to Compassion Focused Therapy for people with eating disorders: A feasibility study.

Signature _____________________________ Date___________________

Please hand this slip to a member of the clinic staff. Thank you.
Participant Information Sheet

An exploration of heart rate variability reactivity in response to Compassion Focused Therapy for people with eating disorders: A feasibility study

Name of Researcher: 
Contact:

You are invited to take part in the research study An exploration of heart rate variability reactivity in response to Compassion Focused Therapy for people with eating disorders: A feasibility study. The lead researcher is undertaking training to become a Clinical Psychologist at the University of Leicester, and this research forms part of their training. Before you decide to participate it is important for you to understand why the research is being done and what it will involve. The lead researcher will go through this information sheet with you and answer any questions you may have. This will take approximately five minutes.

1. What is the purpose of the study?

The study aims to understand how Compassion Focused Therapy affects the body as well as the mind. Compassion Focused Therapy for Eating Disorders (CFT-E) targets shame and self-criticism, which are very common in individuals with eating difficulties. CFT-E helps people to become more self-soothing through the use of taught skills, relaxation and guided imagery. CFT-E has been shown to influence how people with eating difficulties think and feel, but less is known is about how compassion affects the body. The CFT model suggests that compassion stimulates our soothing and contentment system, but there is little evidence to support this claim. The current study is interested in measuring heart rate activity whilst individuals undertake CFT-E therapy group practices as normal. This will help us to understand what goes on in the body when people practice being compassionate, and how this links to treatment outcomes (for example how people feel about themselves and their eating behaviours).

2. Why have I been chosen?

You have been invited to take part because you are accessing treatment at . Everyone who is taking part in a CFT-E treatment programme will be invited to participate. We would like to understand more about how this treatment works and how we can improve our service.
Appendix E: Participant Invitation, Information and Consent Forms

3. Do I have to take part?

Whether you decide to take part in the study is entirely up to you. If you do decide to take part you can change your mind at any time and withdraw. The quality of your care will not be affected in any way by your decision to participate or not.

4. Is there any reason that I won’t be able to take part?

Most people who meet criteria for the CFT-E treatment programme should be able to take part in the research. There are however two main exclusion criteria for the study. Firstly, participation is limited to individuals who do not have any heart problems. Secondly, to take part in the research your first language should be English. If you are concerned that you do not meet the criteria for the study but are still interested in taking part please contact the lead researcher to discuss this in more detail.

5. What will happen to me if I participate?

If you would like to participate, you will be asked to attend an appointment at . The lead researcher will discuss the study with you and gain your written consent to take part. During this appointment you will be given the opportunity to see the heart rate monitor that will be used in the study and you can experience what it would be like to wear the equipment. This should take approximately 30 minutes.

If you agree to take part in the study you will be asked to wear a heart rate monitor during three of your group CFT-E sessions (one at the beginning of treatment, one in the middle of treatment, and one at the end of treatment). During these group sessions you do not need to do anything different from normal, however you will be asked to complete two brief questionnaires at the end of each of the monitored sessions. The treatment itself will be treatment as usual as part of the CFT-E programme.

At the end of the study you will be invited to take part in a focus group. This will involve attending the with other participants from the study for a 30-minute focus group. This additional session will be an opportunity for you to talk about your experience of taking part in the study and to suggest whether any changes could be made to the study in future.

6. What are the possible disadvantages of taking part?

No significant risks have been identified in this study. If, however, you get distressed during any part of the process the researchers will be prepared to take action to make sure a member of the team supports you.

7. What are the possible advantages of taking part?

The findings from this study will help us to understand how people respond to the CFT-E treatment programme. This information can be used to further develop the treatment programme and will allow us to provide evidence-based therapy.

Although there may be no personal benefit in you participating, by taking part you are providing unique and valuable information for this study which will contribute to the continual development of our service.
Appendix E: Participant Invitation, Information and Consent Forms

8. Confidentiality and anonymity

Any information you provide is protected by the Data Protection Act and will be kept confidential at all times. Any treatment you receive is delivered by NHS professionals who adhere to strict rules of confidentiality. The data recorded will only be identifiable by a participant number and all information pertaining to you will be stored using this number with no personal details. All of the data from the study will be stored on NHS premises: Written information from the study will be stored in a locked filing cabinet and electronic data will be stored using password protected files on an encrypted computer.

9. How will the findings of the study be used?

The results will be written up as a report for submission to the University of Leicester as part of the assessment for the Doctorate in Clinical Psychology. The report may also be submitted for publication in a relevant journal. It is hoped that the results from this study will be used to inform the direction of treatment programmes offered to people with eating difficulties. If you would like a summary of the results of the study please inform the lead researcher who will be happy to provide this.

10. Who is funding the research?

The study has been organised by the lead researcher in conjunction with the University of Leicester and Partnership Trust. The Compassionate Mind Foundation has provided funding for the heart rate monitors.

11. Who has reviewed the study?

The study has been reviewed by experienced academics at the University of Leicester and has been subject to scrutiny by the Leicester East Midlands Research Ethics Committee.

12. What will happen if I agree to take part?

If you decide to take part please complete your details and sign the slip on the invitation letter and hand it to a member of staff. Alternatively you can contact the lead researcher directly and an appointment will be arranged.

13. Further information

If you would like more information about the current study please contact the lead researcher

Alternatively, if you would like to find out more about generally taking part in research please contact , your local Service User Research Development Officer (telephone: , email: ).

THANK YOU FOR TAKING THE TIME TO CONSIDER PARTICIPATING
CONSENT FORM

An exploration of heart rate variability reactivity in response to Compassion Focused Therapy for people with eating disorders: A feasibility study

Name of Researcher:

Thank you for agreeing to take part in this research project. Please read this consent form, and ask any further questions you would like to about what will be involved.

Please initial box

1. I confirm that I have read and understand the information sheet dated 20.02.2014 (version 3.0) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

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

3. I understand that I will be asked to wear a heart rate monitor that will record my heart rate activity during three of the CFT-E therapy groups.

4. I understand that my identity will remain anonymous throughout the study; this includes all information collected through questionnaires and heart rate activity recordings.

5. I understand that the data collected will be kept securely on NHS premises.

6. I understand that relevant sections of my medical notes and data collected during the study, may be looked at by individuals from the , from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.

7. I understand that my data will be included as part of assessment for the Doctorate in Clinical Psychology and that results may be published in academic journals.

8. I agree to take part in this study

__________________  __________________  ____________
Name of Participant  Date  Signature

__________________  __________________  ____________
Researcher  Date  Signature
FOCUS GROUP CONSENT FORM

An exploration of heart rate variability reactivity in response to Compassion Focused Therapy for people with eating disorders: A feasibility study

Name of Researcher:

Thank you for agreeing to take part in the focus group for this research project. Please read this consent form, and ask any further questions you would like to about what will be involved.

1. I confirm that I have read and understand the focus group information sheet dated 20.02.2014 (version 2.0) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

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

3. I understand that the focus group will be audio recorded, and then transcribed.

4. I understand that my identity will remain anonymous throughout the study; this includes all information collected through the audio recordings from the focus group.

5. I understand that the data collected will be kept securely on NHS premises.

6. I understand that relevant sections of my medical notes and data collected during the study, may be looked at by individuals from the , from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.

7. I understand that my data will be included as part of assessment for the Doctorate in Clinical Psychology and that results may be published in academic journals.

8. I am willing for the use of anonymised quotes from the focus group to be used in reports and academic publications.

9. I agree to take part in this study

___________________________________________________________________________  _____________  ______________
Name of Participant                                      Date                                      Signature

___________________________________________________________________________  _____________  ______________
Researcher                                              Date                                      Signature

Focus group consent form version 2.0 (date 20.02.2014)
### Appendix F: Social Safeness and Pleasure Scale

**Social Safeness and Pleasure Scale (Gilbert *et al.*, 2009)**

We are interested in how people experience pleasure, positive feelings and emotions in social situations. Below are a series of statements about how you may feel in various situations. Please read each statement carefully and circle the number that best describes how you feel.

<table>
<thead>
<tr>
<th>Almost never</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Almost all the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel content within my relationships</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2. I feel easily soothed by those around me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>3. I feel connected to others</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4. I feel part of something greater than myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5. I have a sense of being cared about in the world</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6. I feel secure and wanted</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>7. I feel a sense of belonging</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>8. I feel accepted by people</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>9. I feel understood by people</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10. I feel a sense of warmth in my relationships with people</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>11. I find it easy to feel calmed by people close to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
Appendix G: Session Rating Scales

1. Thinking back over the last week (please circle on each):
   a) How many times have you practiced trying to generate a compassionate image? ______ times
   b) What do you usually use as your compassionate image? □ Self □ Other
   c) On average how much time did you spend trying to generate a compassionate image?
      Under a minute 1-5 mins 5-10 mins 10-20 mins Over 20 mins
   d) How successful were you at generating a compassionate image?
      Not at all Slightly Moderately Very Extremely
   e) How powerful was your compassionate image?
      Not at all Slightly Moderately Very Extremely
   f) How easy was it to maintain your compassionate image?
      Not at all Slightly Moderately Very Extremely
   g) How comforting was your compassionate image?
      Not at all Slightly Moderately Very Extremely
   h) How helpful was your compassionate image in allowing you to work through your difficulties?
      Not at all Slightly Moderately Very Extremely

2. Thinking about today's session (please circle on each):
   a) What did you use as your compassionate image today? □ Self □ Other
   b) How successful were you at generating a compassionate image?
      Not at all Slightly Moderately Very Extremely
   c) How powerful was your compassionate image?
      Not at all Slightly Moderately Very Extremely
   d) How easy was it to maintain your compassionate image?
      Not at all Slightly Moderately Very Extremely
   e) How comforting was your compassionate image?
      Not at all Slightly Moderately Very Extremely
   f) How helpful was your compassionate image in allowing you to work through your difficulties?
      Not at all Slightly Moderately Very Extremely
IMPORTANT - PLEASE READ THIS FIRST
This form has 34 statements about how you have been OVER THE LAST WEEK.
Please read each statement and think how often you felt that way last week.
Then tick the box which is closest to this.
Please use a dark pen (not pencil) and tick clearly within the boxes.

Over the last week

1. I have felt terribly alone and isolated
2. I have felt tense, anxious or nervous
3. I have felt I have someone to turn to for support when needed
4. I have felt OK about myself
5. I have felt totally lacking in energy and enthusiasm
6. I have been physically violent to others
7. I have felt able to cope when things go wrong
8. I have been troubled by aches, pains or other physical problems
9. I have thought of hurting myself
10. Talking to people has felt too much for me
11. Tension and anxiety have prevented me doing important things
12. I have been happy with the things I have done
13. I have been disturbed by unwanted thoughts and feelings
14. I have felt like crying
Appendix H: Routine Treatment Outcome Measures

CORE-OM continued (page 2)

Over the last week

<table>
<thead>
<tr>
<th>Item</th>
<th>Not at all</th>
<th>Only occasionally</th>
<th>Sometimes</th>
<th>Often</th>
<th>Not at all the time</th>
<th>OFFICE USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 I have felt panic or terror</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>P</td>
</tr>
<tr>
<td>16 I made plans to end my life</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>R</td>
</tr>
<tr>
<td>17 I have felt overwhelmed by my problems</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>W</td>
</tr>
<tr>
<td>18 I have had difficulty getting to sleep or staying asleep</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>P</td>
</tr>
<tr>
<td>19 I have felt warmth or affection for someone</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>F</td>
</tr>
<tr>
<td>20 My problems have been impossible to put to one side</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>P</td>
</tr>
<tr>
<td>21 I have been able to do most things I needed to</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>F</td>
</tr>
<tr>
<td>22 I have threatened or intimidated another person</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>R</td>
</tr>
<tr>
<td>23 I have felt despairing or hopeless</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>P</td>
</tr>
<tr>
<td>24 I have thought it would be better if I were dead</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>R</td>
</tr>
<tr>
<td>25 I have felt criticised by other people</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>F</td>
</tr>
<tr>
<td>26 I have thought I have no friends</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>F</td>
</tr>
<tr>
<td>27 I have felt unhappy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>P</td>
</tr>
<tr>
<td>28 Unwanted images or memories have been distressing me</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>F</td>
</tr>
<tr>
<td>29 I have been irritable when with other people</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>F</td>
</tr>
<tr>
<td>30 I have thought I am to blame for my problems and difficulties</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>P</td>
</tr>
<tr>
<td>31 I have felt optimistic about my future</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>W</td>
</tr>
<tr>
<td>32 I have achieved the things I wanted to</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>F</td>
</tr>
<tr>
<td>33 I have felt humiliated or shamed by other people</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>F</td>
</tr>
<tr>
<td>34 I have hurt myself physically or taken dangerous risks with my health</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>R</td>
</tr>
</tbody>
</table>

THANK YOU FOR YOUR TIME IN COMPLETING THIS QUESTIONNAIRE

Total Scores

Mean Scores

Survey: 151

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Supported by www.coreims.co.uk
Appendix H: Routine Treatment Outcome Measures

Stirling Eating Disorder Scale (SEDS; Williams et al., 1994)

[This material has been omitted by the author of this thesis for copyright reasons]
Appendix H: Routine Treatment Outcome Measures

SEDS continued (page 2)

[This material has been omitted by the author of this thesis for copyright reasons]
### Appendix H: Routine Treatment Outcome Measures

**Eating Disorder Examination Questionnaire**  
*(EDE-Q; Fairburn & Beglin, 1994)*

**Instructions**

The following questions are concerned with the PAST FOUR WEEKS ONLY (28 days). Please read each question carefully and circle the appropriate number on the right. Please answer all the questions.

<table>
<thead>
<tr>
<th>ON HOW MANY DAYS OUT OF THE PAST 28 DAYS ..........</th>
<th>No days</th>
<th>1-5 days</th>
<th>6-12 days</th>
<th>13-15 days</th>
<th>16-22 days</th>
<th>23-27 days</th>
<th>Every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. Have you gone for long periods of time (8 hours or more) without eating anything in order to influence your shape weight?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. Have you tried to avoid eating any foods which you like in order to influence your shape or weight?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. Have you tried to follow definite rules regarding your eating in order to influence your shape or weight; for example, a calorie limit, a set amount of food, or rules about what or when you should eat?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5. Have you wanted your stomach to be empty?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. Has thinking about food or its calorie content made it much more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7. Have you been afraid of losing control over eating?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
Appendix H: Routine Treatment Outcome Measures

EDE-Q continued (page 2)

<table>
<thead>
<tr>
<th>On How Many Days Out of the Past 28 Days ..........</th>
<th>No days</th>
<th>1-5 days</th>
<th>6-12 days</th>
<th>13-15 days</th>
<th>16-22 days</th>
<th>23-27 days</th>
<th>Every Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Have you had episodes of binge eating?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9. Have you eaten in secret? (Do not count binges)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10. Have you definitely wanted your stomach to be flat?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>11. Has thinking about shape or weight made it more difficult to concentrate on things you are interested in; for example read, watch TV or follow a conversation?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>12. Have you had a definite fear that you might gain weight or become fat?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>13. Have you felt fat?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>14. Have you had a strong desire to lose weight?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

| Over the Past Four Weeks (28 Days)             |         |          |           |            |            |            |           |
| 15. On what proportion of times that you have eaten have you felt guilty because the effect on your shape or weight? (Do not count binges) (Circle the number which applies) | 0       | None of the times | 1 – A few of the times | 2 – Less than half the times | 3 – Half the times | 4 – More than half the times | 5 – Most of the time | 6 – Every time |
| 16. Over the past four weeks (28 days), have there been any times when you have felt that you have eaten what other people would regard as an unusually large amount of food given the circumstances? (Please put appropriate number in box) | 0 – No | 1 – Yes | [ ] |
| 17. How many such episodes have you had over the past four weeks? | [ ] [ ] [ ] |
| 18. During how many of these episodes of overeating did you have a sense of having lost control over your eating? | [ ] [ ] [ ] |
### Appendix H: Routine Treatment Outcome Measures

#### EDE-Q continued (page 3)

<table>
<thead>
<tr>
<th>OVER THE PAST FOUR WEEKS (28 DAYS)</th>
<th>0 – No</th>
<th>1 – Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. Have you had other episodes of eating in which you have had a sense of having lost control and eaten too much, but have not eaten an unusually large amount of food given the circumstances?</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>20. How many such episodes have you had over the past four weeks?</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>21. Over the past four weeks have you made yourself sick (vomit) as a means of controlling your shape or weight?</td>
<td>0 – No</td>
<td>[ ]</td>
</tr>
<tr>
<td>22. How many times have you done this over the past four weeks?</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>23. Have you taken laxatives as a means of controlling your shape or weight?</td>
<td>0 – No</td>
<td>[ ]</td>
</tr>
<tr>
<td>24. How many times have you done this over the past four weeks?</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>25. Have you taken diuretics (water tablets) as a means of controlling your shape or weight?</td>
<td>0 – No</td>
<td>[ ]</td>
</tr>
<tr>
<td>26. How many times have you done this over the past four weeks?</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>27. Have you exercised hard as a means of controlling your shape or weight?</td>
<td>0 – No</td>
<td>[ ]</td>
</tr>
<tr>
<td>28. How many times have you done this over the past four weeks?</td>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>
Appendix H: Routine Treatment Outcome Measures

EDE-Q continued (page 4)

<table>
<thead>
<tr>
<th>OVER THE PAST FOUR WEEKS (28 DAYS) (Please circle the number which best describes your behaviour)</th>
<th>NOT AT ALL</th>
<th>SLIGHTLY</th>
<th>MODERATELY</th>
<th>MARKEDLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>29. Has your weight influenced how you think about (judge) yourself as a person?</td>
<td>0 1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. Has your shape influenced how you think about (judge) yourself as a person?</td>
<td>0 1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. How much would it upset you if you had to weigh yourself once a week for the next four weeks?</td>
<td>0 1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. How dissatisfied have you felt about your weight?</td>
<td>0 1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. How dissatisfied have you felt about your shape?</td>
<td>0 1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. How concerned have you been about other people seeing you eat?</td>
<td>0 1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflections, while undressing or taking a bath or shower?</td>
<td>0 1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. How uncomfortable have you felt about others seeing your body; for example, in communal changing rooms, when swimming or wearing tight clothes?</td>
<td>0 1 2 3 4 5 6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix H: Routine Treatment Outcome Measures

Internalized Shame Scale (ISS; Cook, 1994, 1996)

DIRECTIONS: Below is a list of statements describing feelings or experiences that you may have from time to time or that are familiar to you because you have had them for a long time. Most of these statements describe feelings and experiences that are generally painful or negative in some way. Some people will seldom or never have many of these feelings. Everyone has had some of these feelings at some time, but if you find that these statements describe the way that you feel a good deal of the time, it can be painful just reading them. Try to be as honest as you can in responding.

Read each statement carefully and circle the number to the left of the item that indicates the frequency with which you find yourself feeling or experiencing what is described in the statement. Use the scale below. DO NOT OMIT ANY ITEM.

SCALE

0 = NEVER 1 = SELDOM 2 = SOMETIMES 3 = FREQUENTLY 4 = ALMOST ALWAYS

SCALE
0 1 2 3 4 1. I feel like I am never quite good enough
0 1 2 3 4 2. I feel somehow left out
0 1 2 3 4 3. I think other people look down on me
0 1 2 3 4 4. All in all, I am inclined to feel that I am a success
0 1 2 3 4 5. I scold myself and put myself down
0 1 2 3 4 6. I feel insecure about others opinions of me
0 1 2 3 4 7. Compared to other people, I feel like I somehow never measure up
0 1 2 3 4 8. I see myself as being very small and insignificant
0 1 2 3 4 9. I feel I have much to be proud of
0 1 2 3 4 10. I feel intensely inadequate and full of self-doubt
0 1 2 3 4 11. I feel as if I am somehow defective as a person, like there is something basically wrong with me
0 1 2 3 4 12. When I compare myself to others I am just not as important
0 1 2 3 4 13. I have an overpowering dread that my faults will be revealed in front of others
Appendix H: Routine Treatment Outcome Measures

ISS continued (page 2)

0 = NEVER  1 = Seldom  2 = Sometimes  3 = Frequently  4 = Almost Always

SCALE

0 1 2 3 4 14. I have a number of good qualities
0 1 2 3 4 15. I see myself striving for perfection only to continually fall short
0 1 2 3 4 16. I think others are able to see my defects
0 1 2 3 4 17. I could beat myself over the head with a club when I make a mistake
0 1 2 3 4 18. On the whole, I am satisfied with myself
0 1 2 3 4 19. I would like to shrink away when I make a mistake
0 1 2 3 4 20. I replay painful events over and over in my mind until I am overwhelmed
0 1 2 3 4 21. I feel I am a person of worth at least on an equal plane with others
0 1 2 3 4 22. At times I feel like I will break into a thousand pieces
0 1 2 3 4 23. I feel as if I have lost control over my body functions and feelings
0 1 2 3 4 24. Sometimes I feel no bigger than a pea
0 1 2 3 4 25. At times I feel so exposed that I wish the earth would open up and swallow me
0 1 2 3 4 26. I have this painful gap within me that I have not been able to fill
0 1 2 3 4 27. I feel empty and unfulfilled
0 1 2 3 4 28. I take a positive attitude toward myself
0 1 2 3 4 29. My loneliness is more like emptiness
0 1 2 3 4 30. I always feel there is something missing
Appendix H: Routine Treatment Outcome Measures

Other As Shamer Scale (OAS; Allan et al., 1994; Goss et al., 1994)

DIRECTIONS: Below is a list of statements describing feelings or experiences that you may have from time to time or that are familiar to you because you have had them for a long time. Most of these statements describe feelings and experiences that are generally painful or negative in some way. Some people will seldom or never have many of these feelings. Everyone has had some of these feelings at some time, but if you find that these statements describe the way that you feel a good deal of the time, it can be painful just reading them. Try to be as honest as you can in responding.

Read each statement carefully and circle the number to the left of the item that indicates the frequency with which you find yourself feeling or experiencing what is described in the statement. Use the scale below. **DO NOT OMIT ANY ITEM.**

**SCALE**

0 = NEVER  1 = SELLDOM  2 = SOMETIMES  3 = FREQUENTLY  4= ALMOST ALWAYS

<table>
<thead>
<tr>
<th>SCALE</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 1 2 3 4</td>
<td>1. I feel other people see me as not good enough</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>2. I think that other people look down on me</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>3. Other people put me down a lot</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>4. I feel insecure about others opinions of me</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>5. Other people see me as not measuring up to them</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>6. Other people see me as small and insignificant</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>7. Other people see me as somehow defective as a person</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>8. People see me as unimportant compared to others</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>9. Other people look for my faults</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>10. People see me as striving for perfection but being unable to reach my own standards</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>11. I think others are able to see my defects</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>12. Others are critical or punishing when I make a mistake</td>
</tr>
<tr>
<td>0 1 2 3 4</td>
<td>13. People distance themselves from me when I make mistakes</td>
</tr>
</tbody>
</table>
Appendix H: Routine Treatment Outcome Measures

OAS continued (page 2)

0 = NEVER  1 = SELDOM  2 = SOMETIMES  3 = FREQUENTLY  4 = ALMOST ALWAYS

SCALE
0 1 2 3 4  14. Other people always remember my mistakes
0 1 2 3 4  15. Others see me as fragile
0 1 2 3 4  16. Others see me as empty and unfulfilled
0 1 2 3 4  17. Others think there is something missing in me
0 1 2 3 4  18. Other people think I have lost control over my body and feelings
Appendix H: Routine Treatment Outcome Measures

Self Compassion Scale (SCS; Neff, 2003)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the right of each item, indicate how often you behave in the stated manner, using the following scale:

<table>
<thead>
<tr>
<th>Almost Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

1. I’m disapproving and judgemental about my own flaws and inadequacies.
2. When I’m feeling down I tend to obsess and fixate on everything that’s wrong.
3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.
5. I try to be loving towards myself when I’m feeling emotional pain.
6. When I fail at something important to me I become consumed by feelings of inadequacy.
7. When I’m down, I remind myself that there are lots of other people in the world feeling like I am.
8. When times are really difficult, I tend to be tough on myself.
9. When something upsets me I try to keep my emotions in balance.
10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
11. I’m intolerant and impatient towards those aspects of my personality I don’t like.
12. When I’m going through a very hard time, I give myself the caring and tenderness I need.
13. When I’m feeling down, I tend to feel like most other people are probably happier than I am.
14. When something painful happens I try to take a balanced view of the situation.
Appendix H: Routine Treatment Outcome Measures

SCS continued (page 2)

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15.</td>
<td>I try to see my failings as part of the human condition.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16.</td>
<td>When I see aspects of myself that I don't like, I get down on myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17.</td>
<td>When I fail at something important to me I try to keep things in perspective.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18.</td>
<td>When I'm really struggling, I tend to feel like other people must be having an easier time of it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19.</td>
<td>I'm kind to myself when I'm experiencing suffering.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20.</td>
<td>When something upsets me I get carried away with my feelings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21.</td>
<td>I can be cold-hearted towards myself when I'm experiencing suffering.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>22.</td>
<td>When I'm feeling down I try to approach my feelings with curiosity and openness.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23.</td>
<td>I'm tolerant of my own flaws and inadequacies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>24.</td>
<td>When something painful happens I tend to blow the incident out of proportion.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25.</td>
<td>When I fail at something that's important to me, I tend to feel alone in my failure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>26.</td>
<td>I try to be understanding and patient towards those aspects of my personality I don't like.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Appendix H: Routine Treatment Outcome Measures

Forms of Self-Criticizing/Attacking and Self-Reassuring Scale
(FSCRS; Gilbert et al., 2004)

When things go wrong in our lives or don’t work out as we hoped, and we feel we could have done better, we sometimes have negative and self-critical thoughts and feelings. These may take the form of feeling worthless, useless or inferior etc. However, people can also try to be supportive of themselves. Below are series of thoughts and feelings that people sometimes have. Read each statement carefully and circle the number that best describes how much each statement is true for you.

<table>
<thead>
<tr>
<th>Not at all like me</th>
<th>A little bit like me</th>
<th>Moderately like me</th>
<th>Quite a bit like me</th>
<th>Extremely like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

When things go wrong for me:

1. I am easily disappointed with myself
2. There is a part of me that puts me down
3. I am able to remind myself of positive things about myself
4. I find it difficult to control my anger and frustration at myself
5. I find it easy to forgive myself
6. There is a part of me that feels I am not good enough
7. I feel beaten down by my own self-critical thoughts
8. I still like being me
9. I have become so angry with myself that I want to hurt or injure myself
10. I have a sense of disgust with myself
11. I can still feel lovable and acceptable
12. I stop caring about myself
13. I find it easy to like myself
14. I remember and dwell on my failings
15. I call myself names
16. I am gently and supportive with myself
17. I can’t accept failures and setbacks without feeling inadequate
18. I think I deserve my self-criticalism
19. I am able to care and look after myself
20. There is a part of me that wants to get rid of the bits I don’t like
21. I encourage myself for the future
22. I do not like being me
## Appendix H: Routine Treatment Outcome Measures

**Functions of Self-Criticizing/Attacking and Self-Reassuring Scale (FSCS; Gilbert et al., 2004)**

There can be many reasons why people become critical and angry with themselves. Read each statement carefully and circle the number that best describes how much each statement is true for you.

<table>
<thead>
<tr>
<th>Not at all like me</th>
<th>A little bit like me</th>
<th>Moderately like me</th>
<th>Quite a bit like me</th>
<th>Extremely like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### I get critical and angry with myself:

1. to make sure I keep up my standards
2. to stop myself being happy
3. to show I care about my mistakes
4. because if I punish myself I feel better
5. to stop me being lazy
6. to harm part of myself
7. to keep myself in check
8. to punish myself for my mistakes
9. to cope with feelings of disgust with myself
10. to take revenge on part of myself
11. to stop me getting overconfident
12. to stop me being angry with others
13. to destroy a part of me
14. to make me concentrate
15. to gain reassurance from others
16. to stop me becoming arrogant
17. to prevent future embarrassments
18. to remind me of my past failures
19. to keep me from making minor mistakes
20. to remind me of my responsibilities
21. to get at the things I hate in myself
Appendix I: Compassionate Imagery Script

Soothing Breathing Rhythm (3-minutes)

We are now going to help you to turn your soothing system on. Please sit comfortably and you may wish to close your eyes. You can either use your soothing breathing rhythm or your soothing image to help you do this. If you’re focussing on your breathing, just notice a rhythm that you find soothing and calming. It may help to focus your mind by drawing attention to your outbreath. If you’re using your image, imagine what you can see that you would find soothing, perhaps a particular colour or shape or a sound or smell that you find particularly soothing. Or there might be a physical sensation or texture you associate with being soothed. Don’t worry if your mind wanders, this is normal; just gently and kindly bring it back to your breathing or what you find soothing in your image. You may wish to include people or animals in your image or you may wish to be alone. Just imagine you’re in a place that welcomes and soothes you or focus on a breathing rhythm that you find soothing. If your mind wanders, gently and kindly bring it back to your breathing or your image and now your sensations are soothing to develop and grow.

Generating a Compassionate Image (3-minutes)

We are now going to help develop your compassionate mind. You can either imagine you at your best or your compassionate companion; whichever helps you turn your compassionate mind on is fine. You might want to imagine what your compassionate image looks like by how it looks, sits or stands or perhaps the expression on its face when it’s being compassionate. You might want to notice its tone of voice or the way it speaks. It may be other physical sensations that you associate with your compassionate image, perhaps feeling warmth or particular smells or textures. Again don’t worry if your mind wanders away from your image, this is normal; just gently and kindly bring it back to the things in your image that remind you most of compassion.
Appendix I: Compassionate Imagery Script

And when we’re ready we are going to imagine that you step into the shoes of your image to be calming you at your most compassionate or to become your compassionate companion, to notice what it feels like to be able to recognise and see this offering of others and be really committed to wanting to alleviate the suffering, to want to see them flourish and grow. Imagine the wisdom, the courage, the strength that comes from being compassionate, to understand that human beings struggle and that you don’t want to judge them only to help them. Let these feelings of compassion grow in you.

Directing Compassion Towards the Self (3-minutes)

We would now like you to imagine using your compassionate mind to notice your suffering during this week. What would your compassionate mind notice and how does your compassionate mind feel for your suffering? Imagine your compassionate mind understood why you were suffering and doesn’t want to judge you; it only wants to offer you its support, its wisdom, its warmth, its courage. Imagine what your compassionate mind would say to you, what it feels to help you with your suffering and imagine its care and wisdom for you. Imagine what it would be like to be able to listen, to use its support and wisdom and courage. How would your compassionate mind be to you? Imagine how your life would be different if you could accept its compassion.
Appendix J: Focus Group Analysis

Focus Group Analysis

Aim

A qualitative focus group was incorporated to enhance the quantitative acceptability and feasibility data from the main study. This platform gave the current participants the opportunity to share their experiences of taking part in the research.

Methodology

Participants recruited from the first therapy group were invited to take part in the focus group. Out of the four participants invited only two individuals (both male) were available to participate. Both participants gave consent to be interviewed and audio-recorded. The focus group took place immediately after one of the CFT-E treatment programme follow-up sessions. The topic guide for the focus group is outlined in Table J.1.

Table J.1.
Focus group topic guide

<table>
<thead>
<tr>
<th>The acceptability of the research protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>How did participants find taking part?</td>
</tr>
<tr>
<td>Were there any positives about taking part in the study?</td>
</tr>
<tr>
<td>Were there any negatives about taking part in the study?</td>
</tr>
<tr>
<td>What would participants change about the study?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The feasibility of a larger study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would participants recommend taking part in the study to others?</td>
</tr>
<tr>
<td>Is there anything that would stop people from taking part?</td>
</tr>
</tbody>
</table>

The audio recording from the focus group was transcribed and the resulting transcript was analysed using thematic analysis (Braun & Clarke, 2006).
Appendix J: Focus Group Analysis

Results

The themes that emerged from the transcript were the effect of taking part in the study on treatment, feeling aware of being monitored, getting used to wearing the heart rate monitors, reflections on the design of the study, and the value of being involved in research. Quotes have been provided to illustrate each of the superordinate themes.

The effect of taking part in the study on treatment. An important reflection was whether participants had felt that the research study had impacted on their experience of therapy. The participants reflected on the group demands in general, but stated that the research had not been perceived as an additional burden.

I don't even see that it has really affected the group (10)

It didn't have any affect on treatment at all (116)

Feeling aware of being monitored. Comments were made about how participants were initially aware of feeling monitored. Wearing the heart rate monitors early could result in them feeling distracted and self-conscious early on in sessions, whilst at times completing the questionnaires could feel “annoying”. These were thought to be barriers as to why other service users might choose not to participate in the research.

When you first have it on [the heart rate monitor] you are a bit conscious of it. But that’s just ‘cos it’s new (69)

It does get a lot, it does get a lot- sometimes with the questionnaires it’s a bit, it’s a bit of a bore...it does get a bit annoying (134)

“You get used to it”. The main reason that the research seemed to be acceptable to the participants was that after a time participants found that they forgot they were wearing the heart rate monitors. This meant that they felt less self-conscious and stopped trying to control their responses in the group.
Appendix J: Focus Group Analysis

I suppose they might be a bit self-conscious for how its going to be with the heart rate monitor I think, but if they got to try it once or twice then they’d get used to it af-after a few minutes (96)

After the first twenty minutes you just forget it’s there and you just carry on as normal (24)

Reflections on the study design. The participants echoed the sentiments of past service users who had being consulted during the design phase of the current research. The participants felt that the research was best completed in the group, and the timing of the study demands and ease of participating were emphasised.

All you do is put the stuff on, it’s not uncomfortable, and then we have it off. It’s not like it lasts the whole session (71)

I think you would have struggled to get more people to come back in their own time. And to do it at home, we’ve had homework to do at home, and a lot of people haven’t done it at home, so I think people wouldn’t have done it at home. So I think you’ve done it the best way. Do it while we’re here! (85)

The value of being involved in research. The participants commented that although they did not directly gain from taking part in the research, they valued the feeling that their contribution may help others in the future.

You’re getting research that’s helping other people, that’s positive (65)

Discussion

The focus group findings are useful indicators of the acceptability of the study protocol as well as the feasibility of carrying out a larger study. The responses from the participants captured important reflections about what it was like for them to take part in the research. The main caveat to the focus group findings is that only two out of ten participants were able to participate. Unfortunately the timing of the final therapy groups meant that it was not possible to carry out another focus group to supplement the data that had been collected from the first therapy group.
Appendix J: Focus Group Analysis

The focus group revealed that wearing the heart rate monitors can impact on the individual’s participation within the group, for example participants reported initially feeling self-conscious and not wanting to share experiences in the group. It had been emphasised that the study was only interested in the heart rate data during the imagery tasks, and it was interesting that participants still felt conscious of their responses even when the heart rate monitors were in situ but not switched on. Although this raises potential questions about the validity of the heart rate data, participants did reflect that they became less aware of wearing the heart rate monitors over time. This may have mitigated against any initial reservations they may have had about wearing the monitors. Neither of the participants reflected feeling self-conscious about wearing the heart rate monitors during the imagery tasks.

As well as commenting on their experiences, the participants provided insightful reflections about the design of the study. The participants felt that the research had had a minimal effect on their experience of treatment. They did not report feeling pressured into the research or feeling burdened. Admissions were made that the completing the questionnaires could be experienced as “annoying”, although this seemed to pertain to the routine treatment outcome measures as opposed to the study-specific soothing measures. Participants seemed grateful that the research had been designed to minimise the demands that were placed on them, for example completing the research in the group. Whilst the participants commented that there were no immediate benefits of taking part in the research they did report the value of being involved in research in the hope that it might help other people in future.

The participants identified that the main barrier likely to prevent other people from taking part in the research was service users feeling self-conscious early on in therapy. It was felt that the timing of the research was important (i.e., not introducing the research at the very beginning of the group), as well as allowing potential participants time to practice wearing the heart rate monitors in order to feel comfortable in the sessions. This feedback reinforces the need for the equipment demonstrations that take place as part of the consent process.
Appendix J: Focus Group Analysis

It is recognised that these findings from the focus group provide valuable information about the acceptability and feasibility of the current study. A larger study would benefit from securing additional qualitative data to further explore these issues.
Appendix K: Research Ethics Committee Approval Letters

REC Conditional Opinion Letter (18th February 2014)

18 February 2014

Health Research Authority
NRES Committee East Midlands - Leicester
The Old Chapel
Royal Standard Place
Nottingham
NG3 6FS
Telephone: 0115 8839425

Study title: An exploration of heart rate variability reactivity in response to Compassion Focused Therapy for people with eating disorders: A feasibility study

<table>
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<tbody>
<tr>
<td>REC reference: 14/EM/0050</td>
</tr>
<tr>
<td>IRAS project ID: 142667</td>
</tr>
</tbody>
</table>

The Research Ethics Committee reviewed the above application at the meeting held on 07 February 2014.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details, unless you expressly withhold permission to do so. Publication will be no earlier than three months from the date of this favourable opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to withhold permission to publish, please contact the REC Manager Ms Wendy Rees, NRESCommittee.EastMidlands-Leicester@nhs.net

Ethical opinion

The Chair asked you to explain the role of the heart monitor in the study and the scientific justification for its use. You explained that your background is in physiology and psychology and during the study the physical and emotional responses are being recorded which is an alternative way of monitoring the calming response to the therapy.

The Chair asked you to clarify how the focus group would work and what experience you had of leading such a group. You advised that you are very interested in the experiences people had during the study and wearing the monitor. You went on to explain that you have worked in group sessions running therapies.

The Chair advised you that the GP letter was not necessary and that the GP will not need to be informed of the patient’s participation in the study. You acknowledged this.

The Chair informed you that the PIS would need the correct REC name including and would need to be thoroughly checked for typographical and grammatical errors. You agreed that this
Appendix K: Research Ethics Committee Approval Letters

REC Conditional Opinion Letter (page 2)

would be done.

The Chair also informed you that point 1 on the PIS will need to be shortened and rewritten in simpler language. You advised that all participants will have undergone the psychotherapy stage and will be familiar with the terms being used in this section of the PIS.

The Chair asked you to include in the PIS details that the funding will be provided by the Compassionate Mind Foundation. You agreed that this would be done.

The Chair asked you what process would be followed if there were any disclosures of poor practice during the focus groups. You advised that your academic supervisor and several other therapists will be available during the group if you require assistance.

The members of the Committee present gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

Ethical review of research sites

NHS Sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see “Conditions of the favourable opinion” below).

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

1. The Committee would like you to make the following changes to the PIS: -
   
i) Please check the entire document for typographical and grammatical errors.
   
ii) Please check that the correct REC name is included.
   
iii) Please include the name of the funder – the Compassionate Mind Foundation.

2. The Committee would like you to make the following changes to both of the Consent Forms: -
   
i) Please number and include an initial box for the statement “I agree to take part in this study.”
   
ii) Please include the standard regulatory paragraph, which should read: “I understand that relevant sections of my medical notes and data collected during the study, may be looked at by individuals from [company name], from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.”
   
iii) Please include in the Focus Group consent form a clause and signature box stating “I am willing for the use of anonymised quotes from the focus group to be used in reports and academic publications.”
Appendix K: Research Ethics Committee Approval Letters

REC Conditional Opinion Letter (page 3)

You should notify the REC in writing once all conditions have been met (except for site approvals from host organisations) and provide copies of any revised documentation with updated version numbers. The REC will acknowledge receipt and provide a final list of the approved documentation for the study, which can be made available to host organisations to facilitate their permission for the study. Failure to provide the final versions to the REC may cause delay in obtaining permissions.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission (“R&D approval”) should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Where a NHS organisation’s role in the study is limited to identifying and referring potential participants to research sites (“participant identification centre”), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database within 6 weeks of recruitment of the first participant (for medical device studies, within the timeline determined by the current registration and publication trees).

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to contest the need for registration they should contact Catherine Blewett (catherineblewett@nhs.net), the HRA does not, however, expect exceptions to be made. Guidance on where to register is provided within IRAS.

It is responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The documents reviewed and approved at the meeting were:
Appendix K: Research Ethics Committee Approval Letters

REC Conditional Opinion Letter (page 4)

<table>
<thead>
<tr>
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<td>Interview Schedules/Topic Guides</td>
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<td>23 January 2014</td>
</tr>
<tr>
<td>Investigator CV</td>
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<td></td>
</tr>
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<td></td>
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<tr>
<td>Other: CV</td>
<td></td>
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<tr>
<td>Other: Participant Invitation</td>
<td>1</td>
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</tr>
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<td>Other: Focus Group Invitation</td>
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<td>23 January 2014</td>
</tr>
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<td>Other: Lay Summary for the Service User Reference Group</td>
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<td>01 October 2013</td>
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<tr>
<td>Other: GP Letter</td>
<td>1</td>
<td>23 January 2014</td>
</tr>
<tr>
<td>Other: Funding Letter - The compassionate Mind Foundation</td>
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<td>20 December 2013</td>
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<tr>
<td>Other: Internal Peer Review Form</td>
<td></td>
<td>07 October 2013</td>
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<td>Other: Letter addressing the Internal Peer review</td>
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<td>30 October 2013</td>
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<td>Other: Evaluation of Trainee Research</td>
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<td>23 January 2014</td>
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<td>Participant Consent Form: Focus Group Consent Form</td>
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<td>Participant Information Sheet</td>
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<td>Participant Information Sheet: Focus Group information Sheet</td>
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<td>Questionnaire: CEDS Questionnaire Pack</td>
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<tr>
<td>Questionnaire: Eating Questionnaire</td>
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<td>23 January 2014</td>
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<tr>
<td>Questionnaire: Stirling Eating Disorder Scales</td>
<td>1</td>
<td>23 January 2014</td>
</tr>
<tr>
<td>Questionnaire: OAS Scale</td>
<td>1</td>
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<tr>
<td>Questionnaire: ISS Scale</td>
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<td>Questionnaire: SCS</td>
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<tr>
<td>Questionnaire: The Functions of Self-criticising attacking scale</td>
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<td>Questionnaire: The forms of self-criticising attacking and self-reassuring</td>
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<td>Questionnaire: Social Safeness and Pleasure Scale</td>
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<td>Questionnaire: Session Rating Scales</td>
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<tr>
<td>REC application</td>
<td>142667/550686/1/712</td>
<td>14 January 2014</td>
</tr>
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Membership of the Committee

The members of the Ethics Committee who were present at the meeting are listed on the attached sheet.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research
Appendix K: Research Ethics Committee Approval Letters

REC Conditional Opinion Letter (page 5)

Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document “After ethical review – guidance for researchers” gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

14/EM/0050 Please quote this number on all correspondence

We are pleased to welcome researchers and R & D staff at our NRES committee members’ training days – see details at http://www.hra.nhs.uk/hra-training/

With the Committee’s best wishes for the success of this project.

Yours sincerely

Chair

Enclosures: List of names and professions of members who were present at the meeting and those who submitted written comments

Copy to:
Appendix K: Research Ethics Committee Approval Letters

REC Favourable Opinion Letter (21st February 2014)

Study title: An exploration of heart rate variability reactivity in response to Compassion Focused Therapy for people with eating disorders: A feasibility study

REC reference: 14/EM/0050

IRAS project ID: 142867

21 February 2014

Thank you for your letter of 20 February 2014. I can confirm the REC has received the documents listed below and that these comply with the approval conditions detailed in our letter dated 18 February 2014.

Documents received

The documents received were as follows:

<table>
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<tr>
<th>Document</th>
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<tbody>
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<td>20 February 2014</td>
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<tr>
<td>Participant Consent Form</td>
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<td>20 February 2014</td>
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<tr>
<td>Participant Consent Form: Focus Group</td>
<td>2.0</td>
<td>20 February 2014</td>
</tr>
<tr>
<td>Participant Information Sheet</td>
<td>3.0</td>
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<tr>
<td>Participant Information Sheet: Focus Group</td>
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</table>

Approved documents

The final list of approved documentation for the study is therefore as follows:

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<thead>
<tr>
<th>Document</th>
<th>Version</th>
<th>Date</th>
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<tbody>
<tr>
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<td>Investigator CV</td>
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</table>
Appendix K: Research Ethics Committee Approval Letters

REC Favourable Opinion Letter (page 2)

| Other: CV - |  |
| Other: CV - |  |
| Other: Participant Invitation | 1 | 23 January 2014 |
| Other: Focus Group Invitation | 1.1 | 23 January 2014 |
| Other: Lay Summary for the Service User Reference Group | 1 | 01 October 2013 |
| Other: GP Letter | 1 | 23 January 2014 |
| Other: Funding Letter - The compassionate Mind Foundation | | 20 December 2013 |
| Other: Internal Peer Review Form | | 07 October 2013 |
| Other: Letter addressing the Internal Peer review | | 30 October 2013 |
| Other: Evaluation of Trainee Research | | |
| Participant Consent Form | 2.0 | 20 February 2014 |
| Participant Consent Form: Focus Group | 2.0 | 20 February 2014 |
| Participant Information Sheet | 3.0 | 20 February 2014 |
| Participant Information Sheet: Focus Group | 2.0 | 20 February 2014 |
| Protocol | 5 | 01 October 2013 |
| Questionnaire: CEDS Questionnaire Pack | 1 | 23 January 2014 |
| Questionnaire: Eating Questionnaire | 1 | 23 January 2014 |
| Questionnaire: Stirling Eating Disorder Scales | 1 | 23 January 2014 |
| Questionnaire: OAS Scale | 1 | 23 January 2014 |
| Questionnaire: ISS Scale | 1 | 23 January 2014 |
| Questionnaire: SCS | 1 | 23 January 2014 |
| Questionnaire: The Functions of Self critizing attacking scale | 1 | 23 January 2014 |
| Questionnaire: The forms of self criticising attacking and self reassuring | 1 | 23 January 2014 |
| Questionnaire: Social Safeness and Pleasure Scale | 1 | 23 January 2014 |
| Questionnaire: Session Rating Scales | 2 | 23 January 2014 |
| REC application | 142667/550886/1/712 | 14 January 2014 |

You should ensure that the sponsor has a copy of the final documentation for the study. It is the sponsor's responsibility to ensure that the documentation is made available to R&D offices at all participating sites.

14/EM/0050 Please quote this number on all correspondence

Yours sincerely

REC Manager
Appendix L: Model Fit Statistics for Mixed Modelling Analyses

Table L.1.
Model fit statistics for the SDNNchange variable. Fixed effects = Session and Imagery Task, random effects = Participant

<table>
<thead>
<tr>
<th>Covariance Structure</th>
<th>Diagonal (df = 18)</th>
<th>Compound Symmetry (df = 11)</th>
<th>Autoregressive (df = 11)</th>
<th>First-Order Ante dependence (df = 26)</th>
<th>Unstructured (df = 54)</th>
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</thead>
<tbody>
<tr>
<td>-2 Log likelihood</td>
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<td>721.93</td>
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<td>AIC</td>
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<td>BIC</td>
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<td>730.61</td>
<td>722.13</td>
<td>750.34</td>
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Note: AIC = Akaike’s Information Criterion, BIC = Bayesian Information Criterion. Values closer to zero indicate a better model fit to the data.

Table L.2.
F-test of fixed effects for the five covariance structures of the SDNNchange variable

<table>
<thead>
<tr>
<th>Covariance Structure</th>
<th>Diagonal (df = 18)</th>
<th>Compound Symmetry (df = 11)</th>
<th>Autoregressive (df = 11)</th>
<th>First-Order Ante dependence (df = 26)</th>
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<tbody>
<tr>
<td>Session</td>
<td>4.81*</td>
<td>6.47*</td>
<td>3.89*</td>
<td>2.41</td>
<td>3.77*</td>
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<tr>
<td>Imagery Task</td>
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<td>1.76</td>
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<td>1.25</td>
</tr>
<tr>
<td>Session x Imagery Task</td>
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<td>1.19</td>
<td>1.21</td>
<td>1.76</td>
<td>1.04</td>
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</table>

* F-test significant at the .05 level

Table L.3.
Model fit statistics for the transformed RMSSDchange variable. Fixed effects = Session and Imagery Task, random effects = Participant

<table>
<thead>
<tr>
<th>Covariance Structure</th>
<th>Diagonal (df = 18)</th>
<th>Compound Symmetry (df = 11)</th>
<th>Autoregressive (df = 11)</th>
<th>First-Order Ante dependence (df = 26)</th>
<th>Unstructured (df = 54)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2 Log likelihood</td>
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<td>-188.02</td>
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<td>BIC</td>
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<td>-174.38</td>
<td>-179.49</td>
<td>-157.16</td>
<td>-154.06</td>
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Note: AIC = Akaike’s Information Criterion, BIC = Bayesian Information Criterion. Values closer to zero indicate a better model fit to the data.
Appendix L: Model Fit Statistics for Mixed Modelling Analyses

Table L.4.
$F$-test of fixed effects for the five covariance structures of the transformed RMSSD change variable

<table>
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<tr>
<th>Covariance Structure</th>
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<th>Compound Symmetry (df = 11)</th>
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<tr>
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<td>4.21*</td>
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<td>2.59</td>
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<td>Session x Imagery Task</td>
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* $F$-test significant at the .05 level

Table L.5.
Model fit statistics for the Social Safeness and Pleasure Scale variable. Fixed effects = Session, random effects = Participant

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Note: AIC = Akaike’s Information Criterion, BIC = Bayesian Information Criterion. Values closer to zero indicate a better model fit to the data.

Table L.6.
$F$-test of fixed effects for the five covariance structures of the Social Safeness and Pleasure Scale variable

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<th>Compound Symmetry (df = 5)</th>
<th>Autoregressive (df = 5)</th>
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</thead>
<tbody>
<tr>
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<td>5.49*</td>
<td>6.33*</td>
<td>7.03*</td>
<td>6.59*</td>
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</table>

* $F$-test significant at the .05 level
Appendix M: Individual Data Exploration

Individual Data Exploration

Aim

Previous research suggests that individuals can exhibit disparate responses to compassion focused imagery tasks (e.g., soothing versus threat responses) (Rockliff et al., 2008). To further understand the current study’s findings, the individual data were examined to explore if participants in the current study demonstrated noticeable trends.

Method

The soothing and treatment outcome data from the current study were examined on a case-by-case basis. The main focus was on participants who had completed the treatment outcome measures at initial assessment and post-recovery \((n = 5; \text{four males, one female, age range } = 19-31 \text{ years})\). This subsample’s data was used to provisionally explore possible relationships between the soothing and treatment outcome measures.

To give a broad overview, the following variables were examined: soothing (the RMSSDchange data and the Social Safeness and Pleasure Scale; Gilbert et al., 2009), eating disorder symptomatology (the Eating Disorder Examination Questionnaire; Fairburn & Beglin, 1994), shame (the Internalized Shame Scale; Cook, 1994, 1996), and self-criticism (the Forms of Self-Criticizing/Attacking and Self-Reassuring Scale; Gilbert et al., 2004).

Results

Soothing variables. At the group level, participants demonstrated reductions in RMSSDchange (indicative of threat) during the imagery tasks in sessions 11 and 15. Increases in RMSSDchange (indicative of soothing) were found for the final session (session 19). As shown in Figure M.1., there were large variations within the individual data. When visualised separately, it was clear that most individuals followed the same pattern as the group level trend. In contrast to most participants, Participant 5’s profile was consistently negative which suggests that
Appendix M: Individual Data Exploration

they may have continued to experience the imagery task as threatening rather than soothing. It should be noted that although their RMSSD change response were consistently negative there was a relative increase in their RMSSD change data in the final session, suggesting that they did find the imagery task less threatening at the end of therapy.

Figure M.1. RMSSD change data for the participants that completed the treatment outcome measures (n = 5).

For the Social Safeness and Pleasure Scale, at the group level self-reported social safeness increased across the three sessions. As presented in Figure M.2. the subsample data revealed that out of the five participants that completed both sets of treatment outcome measures Participant 1 and Participant 3 reported a decrease in social safeness at the final session. Taken together the soothing outcomes reveal that physiological changes indicative of soothing are not necessarily coupled with changes in social safeness.
Appendix M: Individual Data Exploration

Figure M.2. Social Safeness and Pleasure Scale scores for the participants that completed the treatment outcome measures ($n = 5$). Higher scores indicate higher social safeness.

_Treatment outcomes._ At the group level, significant improvements in eating disorder symptomatology were detected across all four subscales of the Eating Disorder Examination Questionnaire (EDE-Q). In the subsample, all five of the participants demonstrated reductions in their restraint, eating concern, shape concern, and weight concern scores (as shown in Figure M.3.). To establish whether or not the participants exhibited reliable changes in their EDE-Q scores, reliable change indices were calculated (Jacobson & Truax, 1991). The reliable change indices revealed that all of the improvements observed in the EDE-Q subscales were reliable changes with the exception of Participant 1’s weight concern change, although further examination revealed that Participant 1’s weight concern score was already in the non-clinical range at initial assessment. Overall all of the participants demonstrated significant improvements in relation to their eating disorder symptomatology.
Appendix M: Individual Data Exploration

Figure M.3. Change scores for the Eating Disorder Examination Questionnaire (EDE-Q) for the participants that completed the treatment outcome measures ($n = 5$). Decreases indicate an improvement in eating disorder symptomatology.

*Shame and self-criticism.* The Internalized Shame Scale findings at the group level indicated significant improvements in relation to self-esteem. The scores from the subsample generally replicated this finding, with four participants exhibiting increases in self-esteem along with notable reductions in internalized shame (as presented in Figure M.4.). An exception to this trend was observed in the data from Participant 3, who demonstrated little change in their self-esteem coupled with higher internalized shame post-recovery.

Figure M.4. Change scores for the Internalized Shame Scale for the participants that completed the treatment outcome measures ($n = 5$).
Appendix M: Individual Data Exploration

Changes in self-criticism were captured using the Forms of Self-Criticizing/Attacking and Self-Reassuring Scale (FSCRS). At the group level, the FSCRS was associated with reductions in feelings of inadequacy and self-hatred, along with increases in self-reassurance. In the subsample, four of the participants followed this pattern (as shown in Figure M.5.), however the change scores for Participant 3 were much smaller and showed a contradictory trend. Participant 3’s scores indicated a slight increase in feelings of self-inadequacy and self-hatred, coupled with a slight decrease in self-reassurance.

![Figure M.5. Change scores for the Forms of Self-Criticizing/Attacking and Self-Reassuring Scale for the participants that completed the treatment outcome measures (n = 5).](image)

Conclusion

Exploring the soothing and treatment outcome data on a case-by-case basis revealed two interesting case examples.

Participant 5’s physiological response across the three sessions was more in line with a threat response than a soothing response. This participant consistently demonstrated reductions in RMSSDchange, although it was noted that they did exhibit a relative improvement in RMSSDchange in the final session.
Appendix M: Individual Data Exploration

Whilst Participant 5’s physiological response was not indicative of an explicit soothing response, their changes on the soothing and treatment outcome measures were all indicative of improvements.

A contrasting case was found in Participant 3. This participant was found to exhibit a physiological response that was akin to soothing in the final session. They also reported significant improvements in eating disorder symptomatology. Despite these positive changes, Participant 3 reported notably higher levels of internalized shame post-recovery, and their self-criticism scores on the FSCRS demonstrated little change. The findings of Participant 3 reveal that positive outcomes (i.e., increased heart rate variability and reductions in eating disorder symptomatology) can occur in the absence of positive changes in internalized shame or self-criticism.

These preliminary findings suggest that the relationships between soothing and treatment outcomes are complex and require further exploration. There are not direct relationships between the individual soothing measures, and positive treatment outcomes are not dependent on changes in shame or self-criticism. These findings may have important implications for how compassion focused therapy programmes choose to measure outcomes.
Appendix N: Statement of Epistemological Position

Epistemological Position

The research reported in the thesis was conducted from a positivist standpoint. This assumed that the constructs being measured, including compassion, soothing, and eating disorder psychopathology, are constructs that are observable and quantifiable through scientific measurement. This position led to the use of quantitative methodology to investigate the role of compassion and soothing in the treatment of eating disorders.
## Appendix O: Chronology of Research Process

Table O.1.

Chronology of research process

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>October–December 2012</td>
<td>Initial meetings and discussions with potential supervisors</td>
</tr>
<tr>
<td>January 2013</td>
<td>Confirmation of project supervisors</td>
</tr>
<tr>
<td>February 2013</td>
<td>Research questions established</td>
</tr>
<tr>
<td>April–June 2013</td>
<td>Research design clarified</td>
</tr>
<tr>
<td>May 2013</td>
<td>Research proposal submitted for peer review</td>
</tr>
<tr>
<td>June 2013</td>
<td>Peer review meeting for research proposal</td>
</tr>
<tr>
<td>August–December 2013</td>
<td>Preparation for ethical approval process</td>
</tr>
<tr>
<td>November 2013</td>
<td>Meeting with statistician to discuss data analysis</td>
</tr>
<tr>
<td>November–December 2013</td>
<td>Funding application submitted to the Compassionate Mind Foundation; approval for funding obtained</td>
</tr>
<tr>
<td>February 2014</td>
<td>Research Ethics Committee meeting and approval obtained; submission to Research and Development</td>
</tr>
<tr>
<td>March 2014</td>
<td>Research and Development approval obtained</td>
</tr>
<tr>
<td>April 2014</td>
<td>Recruitment and research demonstrations (therapy group 1)</td>
</tr>
<tr>
<td>May–July 2014</td>
<td>Data collection (therapy group 1)</td>
</tr>
<tr>
<td>July 2014</td>
<td>Recruitment and research demonstrations (therapy group 2)</td>
</tr>
<tr>
<td>July–September 2014</td>
<td>Data collection (therapy group 2)</td>
</tr>
<tr>
<td>October 2014</td>
<td>First draft of literature review completed</td>
</tr>
<tr>
<td>November 2014</td>
<td>Recruitment and research demonstrations (therapy group 3)</td>
</tr>
<tr>
<td>November 2014 – February 2015</td>
<td>Data collection (therapy group 3)</td>
</tr>
<tr>
<td>December 2013</td>
<td>Second draft of literature review completed</td>
</tr>
<tr>
<td>February–March 2015</td>
<td>Data analysis</td>
</tr>
<tr>
<td>March 2015</td>
<td>First draft of empirical paper completed</td>
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<tr>
<td></td>
<td>Critical appraisal written</td>
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<tr>
<td>April 2015</td>
<td>Second draft of empirical paper completed</td>
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<tr>
<td></td>
<td>Thesis abstract completed</td>
</tr>
<tr>
<td></td>
<td>Final draft and submission of thesis</td>
</tr>
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</table>
Appendix P: Guidelines to Authors for Journal Targeted for Literature Review

Author Guidelines for the British Journal of Psychology

British Journal of Clinical Psychology
© The British Psychological Society

Impact Factor: 2.377
ISI Journal Citation Reports © Ranking: 2013: 31/111 (Psychology Clinical)

Author Guidelines

The British Journal of Clinical Psychology publishes original contributions to scientific knowledge in clinical psychology. This includes descriptive comparisons, as well as studies of the assessment, aetiology and treatment of people with a wide range of psychological problems in all age groups and settings. The level of analysis of studies ranges from biological influences on individual behaviour through to studies of psychological interventions and treatments on individuals, dyads, families and groups, to investigations of the relationships between explicitly social and psychological levels of analysis.

The following types of paper are invited:

- Papers reporting original empirical investigations
- Theoretical papers, provided that these are sufficiently related to the empirical data
- Review articles which need not be exhaustive but which should give an interpretation of the state of the research in a given field and, where appropriate, identify its clinical implications
- Brief reports and comments

1. Circulation
The circulation of the Journal is worldwide. Papers are invited and encouraged from authors throughout the world.

2. Length
The word limit for papers submitted for consideration to BJCP is 5000 words and any papers that are over this word limit will be returned to the authors. The word limit does not include the abstract, reference list, figures, or tables. Appendices however are included in the word limit. The Editors retain discretion to publish papers beyond this length in cases where the clear and concise expression of the scientific content requires greater length. In such a case, the authors should contact the Editors before submission of the paper.

3. Submission and reviewing
All manuscripts must be submitted via http://www.editorialmanager.com/bjcp/. The Journal operates a policy of anonymous peer review. Before submitting, please read the terms and conditions of submission and the declaration of competing interests.

4. Manuscript requirements
- Contributions must be typed in double spacing with wide margins. All sheets must be numbered.
- Manuscripts should be preceded by a title page which includes a full list of authors and their affiliations, as well as the corresponding author’s contact details. A template can be downloaded from here.
- Tables should be typed in double spacing, each on a separate page with a self-
Appendix P: Guidelines to Authors for Journal Targeted for Literature Review

Author Guidelines for the British Journal of Psychology (page 2)

explanatory title. Tables should be comprehensible without reference to the text. They should be placed at the end of the manuscript with their approximate locations indicated in the text.

* Figures can be included at the end of the document or attached as separate files, carefully labelled in initial capital/lower case lettering with symbols in a form consistent with text use. Unnecessary background patterns, lines and shading should be avoided. Captions should be listed on a separate sheet. The resolution of digital images must be at least 300 dpi.

* All papers must include a structured abstract of up to 250 words under the headings: Objectives, Methods, Results, Conclusions. Articles which report original scientific research should also include a heading 'Design' before 'Methods'. The 'Methods' section for systematic reviews and theoretical papers should include, as a minimum, a description of the methods the author(s) used to access the literature they drew upon. That is, the abstract should summarize the databases that were consulted and the search terms that were used.

* All Articles must include Practitioner Points – these are 2–4 bullet points to detail the positive clinical implications of the work, with a further 2–4 bullet points outlining cautions or limitations of the study. They should be placed below the abstract, with the heading 'Practitioner Points'.

* For reference citations, please use APA style. Particular care should be taken to ensure that references are accurate and complete. Give all journal titles in full and provide DOI numbers where possible for journal articles.

* SI units must be used for all measurements, rounded off to practical values if appropriate, with the imperial equivalent in parentheses.

* In normal circumstances, effect size should be incorporated.

* Authors are requested to avoid the use of sexist language.

* Authors are responsible for acquiring written permission to publish lengthy quotations, illustrations, etc. for which they do not own copyright. For guidelines on editorial style, please consult the APA Publication Manual published by the American Psychological Association.

5. Brief reports and comments
These allow publication of research studies and theoretical, critical or review comments with an essential contribution to make. They should be limited to 2000 words, including references. The abstract should not exceed 120 words and should be structured under these headings: Objective, Method, Results, Conclusions. There should be no more than one table or figure, which should only be included if it conveys information more efficiently than the text. Title, author name and address are not included in the word limit.

6. Supporting Information
BiC is happy to accept articles with supporting information supplied for online only publication. This may include appendices, supplementary figures, sound files, video clips etc. These will be posted on Wiley Online Library with the article. The print version will have a note indicating that extra material is available online. Please indicate clearly on submission which material is for online only publication. Please note that extra online only material is published as supplied by the author in the same file format and is not copyedited or typeset. Further information about this service can be found at http://author-services.wiley.com/bauthor/supmat.asp