MAJOR RESEARCH PROJECT

LITERATURE REVIEW:

Are Compassion-Focused Interventions Effective in Reducing Feelings of Shame, Negative Cognitions of the Self, and/or Post-traumatic Stress Symptoms in Adults with PTSD?

EMPIRICAL PAPER:

Immediate Psychophysiological Effects of Induced Self-compassion State on Experience of Shame Following a Psychosocial Stress Test.

Submitted by Aleksandra Laszczynska, to the University of Exeter as a thesis for the degree of Doctor of Clinical Psychology, May 2020.

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I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

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Author’s Declaration
The systematic literature review was completed independently by the author. In terms of the empirical work, all aspects of the study, including participant recruitment, data collection, analysis and write up were completed independently by the author. Consent, information sheet and debrief forms were taken from the previous research by Dr. Lewis Pettit (2017) and modified for the needs of this research.
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EMPIRICAL PAPER

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School of Psychology

Doctorate in Clinical Psychology

Systematic Review

Are Compassion-Focused Interventions Effective in Reducing Feelings of Shame, Negative Cognitions of the Self, and/or Posttraumatic Stress Symptoms in Adults with PTSD?

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Abstract

Background: Despite growing evidence showing links between Post Traumatic Stress Disorder (PTSD) and shame, and the protective role of self-compassion in relation to shame and self-criticism, there is no systematic review of the existing literature investigating whether Compassion Focused Interventions (CFI) reduce shame in people with PTSD.

Objectives: This review addresses this gap and evaluates the research investigating the impact of CFIs on shame and negative cognitions of the self in adults with PTSD.

Method: A systematic review, with no time restrictions, was completed using PsycINFO, Medline, Embase, Web of Science, Psychology & Behavioral Sciences Collection, PILOTS and PubMed. Additionally, relevant websites with articles by key authors in the field of interest were checked. References of included articles were screened to identify other relevant research studies.

Results: In identifying only four articles, the review revealed research in this area is scarce. There is evidence that CFIs can lead to reductions in PTSD symptoms, shame and negative cognitions of the self (e.g., self-blame, guilt) in people with PTSD. However, due to a small number of studies included in this review, with mainly weak methodologies, it is impossible to reliably establish the effect of CFIs on people with PTSD.

Conclusions: CFIs have a potential to reduce shame and negative cognitions of the self in adults with PTSD. However, due to limited research in this area and existing studies having weak methodologies, further research is needed with more studies incorporating stronger methodologies (e.g., Randomised Controlled Trials comparing CFIs with an active control group).
Keywords: self-compassion, post-traumatic stress disorder, shame, negative cognitions, self-criticism
Introduction

Post-traumatic stress disorder (PTSD) is a debilitating mental health disorder associated with a significant life disability, dysfunction, and morbidity (Schnurr, Friedman, Sengupta, Jankowski, & Holmes, 2000) that may develop after a traumatic life event (e.g., childhood abuse). Symptoms of PTSD include intrusions (e.g., distressing memories of the traumatic event), persistent avoidance of reminders of the traumatic event, marked changes in arousal associated with the traumatic event (e.g., hypervigilance, anger outbursts) and negative changes in cognitions and mood associated with the traumatic event (American Psychiatric Association [APA], 2013). The former includes persistent inability to experience positive emotions, negative beliefs about oneself, others, and/or the world (e.g., “I am bad”) and persistent negative emotional state such as shame (APA, 2013).

Lifetime prevalence rates of PTSD in community samples are 8.3% (Kilpatrick et al., 2013) and PTSD is an important risk factor for suicidal ideation (Gradus, King, Galatzer-Levy, & Street, 2017), suicide attempts (Sareen et al., 2007; Nock, 2009) and completed suicide (Gradus et al., 2010).

Whereas a number of interventions used for PTSD are shown to be effective in reducing PTSD symptoms, such as Trauma- Focused Cognitive Behavioral Therapy (TF-CBT; Watkins, Sprang, & Rothbaum, 2018) or Eye Movement Desensitization and Reprocessing (EMDR; Novo-Navarro et al., 2018), a meta-analysis showed high dropout rates for PTSD treatments ranging from 18% (all treatments for PTSD) to 36% for trauma-specific treatments (Imel, Laska, Jakupcak, & Simpson, 2013). Correspondingly, another meta-analysis demonstrated that people with low and high PTSD severity levels have low therapy gains and there is a need to develop different interventions for individuals with PTSD who do not respond
to the standard treatments (Haagen, Smid, Knipscheer, & Kleber, 2015). Some studies proposed that the lack of therapy gains may be because current PTSD treatments do not address shame (Saraiya & Lopez-Castro, 2016; Vermetten & Jetly, 2018).

Research shows that shame is an important factor to consider in PTSD treatment as it can amplify the impact of trauma, and associated self-criticism can be a barrier to engagement in care and treatment (Gaudet, Sowers, Nugent, & Boriskin, 2016). Higher levels of shame in people with PTSD are linked to higher levels of self-critical thinking (Harman & Lee, 2010).

**PTSD, Shame and Negative Cognitions of the Self**

Shame is a self-conscious emotion, associated with anger, anxiety and disgust, experienced when the core aspect of the self is judged as inadequate, inferior or defective (Gilbert & Procter, 2006). It also includes a self-criticism component, where in shame-inducing situations, an individual may become critical, hostile and devaluating towards themselves (Gilbert, 1997). This leads to feeling overwhelmed by self-judgement and perceived judgement from others, with a desire to escape from a shameful situation, and avoid the emotional pain associated with it by withdrawing from other people and socially isolating oneself (Van Vliet, 2008; Tangney & Dearing, 2002).

Research shows that shame is implicated in PTSD (Koenig, Youssef, & Pearce, 2019) and contributes to the development of PTSD symptoms (La Bash & Papa, 2014) the symptoms severity (Cunningham, Davis, Wilson, & Resick, 2018) and a change in shame predicts change in PTSD symptoms (Øktedalen, Hoffart, & Langkaas, 2015).
Ehlers’ and Clark’s (2000) cognitive model of PTSD proposes that the persistence of symptoms is related to an individual’s negative trauma appraisals such as the individual’s perception that their internal standards were violated. This leads to negative emotions such as self-blame or shame. Taylor (2015) identified that, based on Nathanson’s (1992) model of shame regulation, people with PTSD may regulate shame in various maladaptive ways such as an attack on self (e.g., self-disgust), avoidance (e.g., alcohol misuse to keep shame away from awareness), attack on other (e.g., aggression) or withdrawal (e.g., social isolation). Indeed, research shows that individuals with PTSD and high levels of shame engage in maladaptive ways of coping as shown by drug misuse in individuals with high levels of shame (Weiss, Duke, Overstreet, Swan, & Sullivan, 2016), links between PTSD and aggression (Augsburger & Maercker, 2020), self-disgust (Brake, Rojas, Badour, Dutton, & Feldner, 2017) and social isolation (Wilson, Hill, & Kiernan, 2018). Taylor (2015) therefore recommended that PTSD interventions should explore shame-related changes in self-concept to identify and address any underlying shame.

Shame can also prevent people with PTSD from disclosure of shame-related issues and leave them with self-punishment, negative ruminations, and prevent them from connecting to networks of support (Forbes, Creamer, Hawthorne, Allen, & McHugh, 2003), hindering the recovery process.

A literature review exploring the role of shame in PTSD showed there is an association between shame and PTSD. The studies included in the review demonstrated that shame has an important role in the emergence and maintenance of PTSD. Recognizing and intervening on shame was shown to reduce shame and the decrease in levels of shame corresponded to improvements in PTSD symptoms. The authors highlighted that despite the significance of this topic, there is a dearth of
empirical research investigating the influence of shame on PTSD treatment and a lack of studies on shame-specific interventions for PTSD.

This review will address this gap by reviewing available research evidence in Compassion Focused Interventions (CFIs), that are known to reduce psychopathology (Pettit, 2017) and shame in trans diagnostic populations, including people with mood and personality disorders (Cuppage, Baird, Gibson, Booth, & Hevey, 2018), by investigating their potential to reduce shame, negative cognitions of the self and PTSD symptoms in a PTSD population.

**Compassion Focused Interventions and PTSD**

The National Institute for Health and Care Excellence’ (NICE; 2018) guidelines for PTSD highlight the importance of recognizing and managing any barriers to engaging with trauma-focused therapies, such as emotional dysregulation or negative self-perception. However, the guidelines do not advise on any specific approach to use.

One of the models that can be used to work with emotional dysregulation and negative self-perception is a model promoting a development of self-compassion (Gilbert, 2005; 2009; 2014). Self-compassion “involves being touched by and open to one’s own suffering, not avoiding or disconnecting from it, generating the desire to alleviate one’s suffering and to heal oneself with kindness” (Neff, 2003a, p.87). CFIs aim to increase self-compassion and help individuals with high levels of shame to develop a more compassionate and kind attitude towards themselves (Gilbert, 2009; 2010; 2014). Indeed, research shows that CFIs increase self-compassion (Frostadottir & Dorjee, 2019) and, in turn, the development of self-compassion leads to reductions in shame and self-criticism in trans diagnostic populations (Cuppage et al., 2018).
Gilbert’s (2009) model of affect regulation (see Figure 1) explains potential mechanisms related to the beneficial impact of self-compassion. The model includes “Incentive and resource-seeking”, “Threat and self-protection”, and “Soothing and contentment” systems.

**Figure 1.** The interaction between the three affect regulation systems adopted from Gilbert (2009)

It was theorized that the threat system function is to recognize and alert an individual about a potential threat and to protect them from harm. The incentive system motivates and encourages an individual to achieve and succeed and the
soothing system’s function is to help an individual to feel content, safe, as well as experience positive affect and diminish feelings of threat (Gilbert 2009). According to the model, people switch between the three systems to manage their emotions and mental health difficulties arise from an imbalance between them (Gilbert, 2010). This is normally reflected in an over activation of the threat system and an under activation of the soothing system responsible for affiliative emotions (Gilbert, 2010).

The compassion-focused approach recognizes that negative self-evaluations (e.g., self-criticism, self-blame) and emotions, such as shame, are defensive responses associated with the threat system (Gilbert, 2014). The model highlights the importance of the activation of the affiliative emotion system to work with the threat system cognitions and emotions (Gilbert, 2009). This leads to the re-coding of emotional memory with the new affect processing system (soothing) that was evolved to down-regulate threat (Gilbert, 2014). It is proposed that the positive and negative emotional states are incompatible therefore stimulating feelings of warmth, safeness and contentment should replace previous threat-related emotions (Gilbert, 2005). A meta-analysis showed that affiliative affect and behavior can regulate a hyperactive threat system (Kirby, Tellegen, & Steindl, 2015) thus having potential to reduce self-criticism and shame.

Neff and Germer (2015) proposed that the activation and development of the soothing system, leading to an increase in self-compassion, can help individuals cope with and attenuate the threat responses in PTSD (e.g., intrusions, negative self-evaluations, feelings of shame). In line with this, preliminary research shows that CFIs lead to reductions in PTSD symptoms and shame in people with PTSD (Au, Sauer-Zavala, King, Petrocchi, Barlow & Litz, 2017; Bowyer, Wallis, & Lee, 2014).
Corresponding with the aforementioned, Saraiya’s and Lopez-Castro’s (2016) systematic review demonstrated shame is associated with an emergence and maintenance of PTSD and another review showed that CFIs reduce PTSD symptoms but the mechanism of these protective effects is unknown (Winders, Murphy, Looney, & O’Reilly, 2020). A systematic review by Westerman, McCann and Sparkes (2020) concluded that mindfulness and CFIs reduce shame-based psychological distress, however the authors used a heterogeneous adult population and included two different models, mindfulness-based and compassion-focused. This makes it difficult to ascertain whether mindfulness or self-compassion were the mechanisms of change in reduction of shame and whether this applies to individuals with PTSD. Moreover, another literature review revealed that CFIs can reduce PTSD symptoms (Shepstone, 2017) however when compared to active controls, CFIs were not superior at reducing PTSD symptoms. However, Shepstone (2017) did not investigate the impact of CFIs on changes to feelings of shame and CFIs, which may be a potential mechanism of change. If CFIs reduce shame in people with PTSD they could be used to address shame in people with PTSD prior to standard treatment (e.g., TF-CBT) or incorporated into a standard treatment for people with PTSD and high levels of shame.

The above shows that despite the volume of evidence showing the links between PTSD and shame, and the protective role of self-compassion in relation to shame and self-criticism, there is currently a lack of understanding of the evidence for whether CFIs reduce shame in people with PTSD and this literature review will explore this area.
Aims and Objectives

The aim of the current review is to investigate whether CFIs reduce shame and/or negative cognitions in people with PTSD. It will explore whether increases in self-compassion, following CFI, correspond to changes in shame, negative cognitions and/or PTSD symptoms in a PTSD population.

This systematic literature review will aim to answer the following question: Are CFIs effective in reducing feelings of shame, negative cognitions of the self, and/or posttraumatic stress symptoms in adults with PTSD?

Method

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses Guidelines (PRISMA-P: Moher et al., 2015; see Appendix A) was used to conduct this systematic review.

Eligibility Criteria

The PICOS (participants, intervention/exposure, comparator, outcome, study design) criteria were used to determine eligible studies. The PICOS criteria can be found in Table 1.

Table 1

<table>
<thead>
<tr>
<th>PICOS Criteria</th>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Adults</td>
<td>People who experienced trauma but do not have PTSD diagnosis</td>
</tr>
<tr>
<td></td>
<td>Diagnosis of PTSD with any of the diagnostic measures recommended in systematic review by Brewin (2005)</td>
<td></td>
</tr>
<tr>
<td>Intervention/Exposure</td>
<td>Experimental self-compassion induction methods</td>
<td>Brief mindfulness training (e.g., experimental mindfulness induction)</td>
</tr>
<tr>
<td></td>
<td>Compassion-facilitating CBT, Compassion-Focused Therapy, Loving Kindness Meditation (LKM), Mindfulness Based</td>
<td>Dialectical Behaviour Therapy (DBT) and</td>
</tr>
</tbody>
</table>
Stress Reduction, Mindfulness Based Cognitive Therapy and other interventions that use elements of compassionate focused approach to facilitate self-compassion (e.g., integrative therapy interventions such as compassionate EMDR or Schema Therapy with addition of compassion focused elements)

Interventions that have an explicit compassion-element such as Compassion Focused Therapy, Self-Compassion training, LKM, and integrative training that have compassion modules such as compassionate EMDR, schema therapy or imagery rescripting

Interventions that have been shown to increase self-compassion and that include mindfulness elements but have no explicit compassion element (such as MBCT)

Individual and group interventions will be included.

Comparator
Waiting list control or treatment as usual groups will be included as well as any active controls.

As there is limited relevant literature in this area, studies that did not use a control group will also be included.

Outcome
PTSD measures:
The Clinician administered PTSD scale (CAPS)
The PTSD checklist (PCL)

Acceptance Commitment Therapy if used alone and do not include self-compassion component because they contain mindfulness but not compassion-facilitating component

CBT

None.

Studies that do not provide information about PTSD diagnosis or how diagnosis was established

Studies that do not include relevant self-
The PTSD Symptom Scale (PSS)

The Impact of Event Scale (IES-R)

The Structured Clinical Interview for DSM-IV (SCID)

Any valid measure from a systematic review by Brewin (2005) such as Posttraumatic Stress Diagnostic Scale (PDS), Self-Rating Scale for Posttraumatic Stress Disorder (SRS-PTSD), Posttraumatic Stress Disorder Questionnaire (PTSD-Q)

Trauma-related shame or negative appraisal:

The Posttraumatic Cognitions Inventory (PTCI)

Studies that used any shame or negative self measure which included negative trauma related cognitions

The Forms of Self-Criticizing/Attacking Reassuring Scale (FSCRS)

Internalized Shame Scale (ISS)

Any validated scales from the systematic review of self-criticism measures will be included (Rose & Rimes, 2018) such as Self-Critical Rumination Scale (SCRS)

Any acceptable measures used previously to measure shame in people with PTSD as described in a systematic review by Sarayia & Lopez-Castro (2016) such as Abuse Specific Shame Questionnaire (ASSQ), Experience of Shame Scale (ESS), Shame Vulnerability...
Questionnaire (SVQ), The Shame Questionnaire (TSQ)

Self-compassion:

Valid measures of self-compassion such as the Self-compassion Scale (SCS; Neff, 2003) or The Compassionate Engagement and Action Scales (Gilbert et al., 2017).

In terms of qualitative studies (e.g., case studies), if they do not use valid self-compassion, shame or negative trauma related evaluations measures, but provide qualitative descriptions of changes to self-compassion, shame and or trauma related negative self evaluations, they will be included.

Study Design

Qualitative, quantitative, cohort, correlational and longitudinal studies, as well as case reports, Randomized Controlled Trials, controlled trials, case series, and any naturalistic and experimental design will be included.

Additional Criteria

Only studies from peer-reviewed journals and those written in English will be included in the review.

Not published in English.

Commentaries, book chapters, conference posters and abstracts, magazine or newspaper articles

Doctoral theses will be excluded due to lack of time and resources.
Search and Selection Strategy

The search terms were generated by reviewing previous systematic reviews looking at CFIs and psychopathology (Pettit, 2017; Shepstone, 2017), theoretical understanding of the constructs of interest, and discussions with a researcher in this field. This review included studies, which used compassion-focused or mindfulness-based interventions, including Mindfulness Based Cognitive Behavioral Therapy (MBCT), which were designed to increase self-compassion with clinical populations identified as having PTSD. MBCT was included as research shows that it increases self-compassion (Frostadottir & Dorjee, 2019; Proeve, Anton & Kenny, 2018) and a systematic review concluded that self-compassion is an important mechanism of change in MBCT (MacKenzie, Abbott, & Kocovski, 2018). In terms of shame and negative post-traumatic self-evaluations, the searches included the terms related to shame and negative self-appraisals as proposed by the previous models and research (Ehlers & Clark, 2000; Gilbert & Procter, 2006; Tangney & Dearing, 2002).

Truncated terms were denoted by * to enable searching of all possible endings from that word stem and search terms were combined with Boolean operators (see Table 2). This was to ensure that studies containing PTSD AND compassion AND shame terms were identified.

The following electronic databases were searched with no time restrictions: PsycINFO, Medline, Embase, Web of Science, Psychology & Behavioral Sciences Collection, PILOTS and PubMed. Additionally, relevant websites (The Compassionate Mind Foundation, Self Compassion) with articles by key authors in the fields (e.g., Gilbert, Neff) were checked. References of included articles were screened to identify other relevant studies.
Table 2

*Search Terms*

<table>
<thead>
<tr>
<th>Concept</th>
<th>Terms</th>
</tr>
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<tbody>
<tr>
<td>Self-compassion ‘OR’</td>
<td>Compassion-Focused Therapy, Mindful self-compassion, Compassion Focused, Compassion-Focused CFT, Compassio*, CFT, MBSR, loving-kindness, MBCT, mindfulness based stress reduction, self-kindness, mindfulness-based cognitive therapy, LKM, MSC, Compassio* induction*, Compassio* train*, Compassionate Mind Training</td>
</tr>
<tr>
<td>‘AND’</td>
<td>Post-traumatic Stress Disorder ‘OR’</td>
</tr>
<tr>
<td>‘AND’</td>
<td>Shame* ‘OR’</td>
</tr>
<tr>
<td>Shame*</td>
<td>self-deva*, self-critic*, self-attack*, self-hat*, self-depreciat*, negative posttraumatic appraisals, negative self-</td>
</tr>
</tbody>
</table>
Data Collection and Risk of Bias Assessment

Databases were searched with no restriction to title and abstract as a scoping search resulted in more articles when those limits were not applied. Titles and abstracts of identified articles were transferred to the Mendeley Reference Manager and reviewed against the eligibility criteria using PICOS inclusion and exclusion criteria. Studies that met inclusion criteria, or it was unclear from an abstract whether they should be excluded, were selected for the full-text screening. To validate the process, another researcher rated six articles at the full text screening stage and made an independent decision as to whether the study should be included in the review based on PICOS criteria. The second rater also reviewed the quality of three studies that are included in the review using qualitative and quantitative assessment tools. Inter-rater agreement for inclusion was 100%, yielding a kappa coefficient of 1.0 (McHugh, 2012). For the quality assessment, initial minor disagreements were discussed and resolved resulting in 100% inter-rater agreement with a kappa coefficient of 1.0 (McHugh, 2012). Figure 2 shows the PRISMA process for the search and screening of the articles.
Figure 2. PRISMA flowchart of the screening process for included articles

Data Extraction

A document was created in Microsoft Word to extract relevant data from the included articles. This consisted of information about author, year of publication,
population and sample size, design, intervention and comparator, diagnostic and outcome measures and the main findings (see Table 3).

**Evaluation Criteria**

The quantitative articles were evaluated using the Quality Assessment Tool for Quantitative Studies (EPHPP, 1998; see Appendix B), which provides a standardized way of assessing study quality and assists with a development of recommendations for study findings. The EPHPP has acceptable content and construct validity (Thomas, Ciliska, Dobbins, & Micucci, 2004) and reliability (Armijo-Olivo, Stiles, Hagen, Biondo, & Cummings, 2012). It assesses the quality of different domains including selection bias, blinding, data collection method, study design, confounders, intervention integrity, withdrawals/dropouts and analyses. The studies can be assessed in each domain as weak, moderate or strong. The articles were not excluded on the basis of their EPHPP rating, due to limited research in this area.

For the qualitative studies, Clinical Appraisal Skills Programme (CASP; Critical Appraisal Skills Programme 2018) was used (see Appendix C). The CASP is a 10-item checklist designed to evaluate qualitative studies by assessing a range of domains including methodology, design, recruitment strategy, data collection, relationships between researcher and participants and data analysis. The authors do not provide a scoring system but recommend a qualitative evaluation. However, to support the evaluation of the articles in this review, a domain was scored as 0 if the criteria was not met or there was not enough information to evaluate the criteria, 0.5 was given if the criteria was partly met and 1 was given where the criteria question was completely met. Subsequently the scores for each question were totaled to get an overall score out of 10 for each article. Scores between 0 and 4 were rated as a low quality of research, 4.5-7 of medium quality and 7.5-10 as high quality.
Results

Four articles met the inclusion criteria. A summary of these studies is presented in Table 3.

Population

All studies included a clinical population \( (N = 37) \) with the sample either diagnosed with PTSD (2), meeting criteria for “Probable PTSD” (1, 4) or having scores on a PTSD measure suggestive of PTSD (3). One study (4) used heterogeneous samples of trauma survivors with Substance Use Disorder (SUD) and co-morbid PTSD or other mental health difficulties such as anxiety and depression. In this study, only 72% of people met the “Probable PTSD” criteria on PCL-5.

Only two studies reported the nature of trauma and time relapsed since trauma (1, 3) whereas one study stated that participants had a variety of traumatic experiences from repeated traumatic experiences in childhood to a single traumatic event in adulthood (2) or did not provide any information about trauma type (4). All studies had a small sample size ranging from 19 in cohort study (4) to one in a single case study (3). The total number of participants for all of the studies was 37, comprising 19 females, 17 males and one non-binary.

Intervention

All studies included an intervention with an explicit self-compassion component, however, the studies differed in terms of intensity, length, format and structure of the intervention. For example, some studies included new adapted CFIs, which comprised Mindful-Self Compassion (MSC), Compassion Mind Training (CMT) techniques (1, 4) and delivered it in six weekly individual sessions (1) or four weekly group sessions (4). Other studies, however, included clients who had received
standard CFT in a group and individual format (2) or the compassion intervention was combined with another treatment such as EMDR (3) or SUD intervention (4). All of the studies provided a comprehensive summary of the compassion intervention and the protocol they have used. In some studies, the facilitators of the interventions received training (1, 2) and supervision (1, 2, 4) to deliver the intervention but in one study this information was missing (3). Only one study reported on adherence ratings (1).

**Comparator**

None of the studies had a control group.

**Outcome**

Most studies implemented self-report diagnostic tools for PTSD (1,3,4) but one used DSM-IV Text Revision manual to assess for a clinical diagnosis of PTSD (2); the instruments used for the diagnostic assessment are known to be valid for PTSD diagnosis (Brewin, 2005). In terms of self-compassion measures, two studies used The Self-Compassion Scale (SCS; Neff, 2003; 1, 4), which has good psychometric properties (Neff, 2003), and one SCS short version (3), which is a valid and reliable alternative to the long-form SCS (Raes, Pommier, Neff, & Van Gucht, 2010). One study provided qualitative descriptions of self-compassion and changes related to receiving CFI (2). To measure shame or trauma related negative cognitions, one study used the Internalized Shame Scale (ISS), which has good psychometric properties (Cook, 2001) (1), one used The Trauma-Related Shame Inventory (TRSI; Øktedalen et al., 2014), which is a valid and reliable measure of shame in people with PTSD (Øktedalen et al., 2014) (4), another used qualitative descriptions of shame (3) whilst another reported qualitative descriptions of self-criticism (2). Each study used different outcome measures to assess shame and
negative cognitions of the self, making it difficult to compare the findings and make conclusions.

Study Design

One study in this review used cohort pre and post repeated measures design (4), one a randomized, non-concurrent, multiple baseline experimental design (1), one a qualitative research design (2) and another used a case study incorporating mixed methods (3). Three studies used pre and post intervention quantitative measures (1, 3, 4) and one used Interpretative Phenomenological Analysis (IPA) to explore participants’ experience of having CFT for trauma (2). Two studies provided follow up data (1,3) and three studies provided graphical and/or descriptive methods to present the change in outcome measures (1,3,4). Two studies (1, 4) had high withdrawal and dropout rates with less than 60% of participants completing the research whilst the remaining studies had all of the participant’s completing the research (2, 3). However, one of those studies had only one participant and involved individual therapy (3) whilst one was an exploration of individuals’ experiences of CFT who have completed CFI before the study (2), therefore the dropout or withdrawal rate for those studies could not be reliably assessed in the context of the intervention. In summary, the review included heterogeneous research designs and half of the studies had high dropout rates. The quantitative studies (1,4) used per-protocol analysis, which provide an estimate of the efficacy of an intervention among individuals who completed the intervention, however, it does not represent the drop outs or withdrawals in clinical situations therefore it is likely to show overestimated intervention effects (Ranganathan, Pramesh, & Aggarwal, 2016). Analyzing data with intention-to-treat principles (including data for all participants regardless of whether
they completed the intervention) could provide a less biased measure of efficacy of the treatments (McCoy, 2017).

**Quality Assessment**

All of the studies assessed with the EPHPP were rated as overall weak (1, 3, 4) however one of the studies used mixed methods and was also rated on the CASP achieving a “Moderate” rating (3). The weakness for two studies was the high rate of withdrawals and dropouts with less than 60% of people enrolled completing the study (1, 4) and for one selection bias (1). None of the studies were appropriate to be assessed for confounders on the EPHPP and there were no Randomized Controlled Trials (RCT) included in the review. All of the studies were rated as “Strong” in EPHPP for data collection method as they used measures with good psychometric properties.

In terms of the qualitative assessment CASP, one study was rated as “Strong” (2) and one as “Moderate” (3). The strengths of both qualitative studies included a clear statement of the aims of the research and the value of the research (2, 3). However only one of these studies (2) had an appropriate qualitative methodology, data collection and analysis and considered the relationship between researcher and participants and ethical issues.
Table 3

Summary of Articles

<table>
<thead>
<tr>
<th>Author(s) and Country</th>
<th>Population</th>
<th>Diagnostic and Outcome Measures</th>
<th>Intervention and Comparator</th>
<th>Study design, Withdrawals and Dropouts, Results and Author’s Conclusions</th>
<th>Evaluation</th>
<th>Quality Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Au, Sauer-Zavala, King, Petrocchi, Barlow &amp; Litz (2017)</td>
<td>A community sample of 10 adults with elevated trauma-related shame and PTSD symptoms. Participants met the criteria for &quot;Probable-PTSD&quot; on the PCL-5, with scores suggesting moderate to severe symptoms of PTSD (M = 47.90, SD = 9.05, range 36 to 61). 8f, 1m, 1 non-binary (N = 10)</td>
<td>Diagnostic: TLEQ PCL-5 Outcome: Shame: ISS Self-compassion: SCS Self-blame: self-blame subscale of the PTCL-sb; Respondents Treatment credibility: CEQ</td>
<td>Intervention: 6-sessions intervention designed to increase SC. The intervention included adapted exercises from CFT, MSC and a CFT protocol for PTSD (Lee &amp; James, 2013). Participants received six weekly, 60–90 minute individual sessions of compassion-facilitating intervention. Comparator: None</td>
<td>Study Design: A randomized, nonconcurent, multiple baseline experimental design. Participants were randomized to a 2-, 4-, or 6-week baseline phase and completed weekly assessments during baseline, a 6-week treatment phase, and at follow up (FU) two and four weeks after the intervention. Change in scores was calculated for each participants on every measure from first baseline session to pre-treatment (last baseline session), change from pre to post treatment and change from pre treatment to FU. Withdrawals and dropouts: 206 people were assessed for eligibility (181 excluded due to not meeting study inclusion criteria), 25 had a face-to-face eligibility assessment. 17 participants were randomized to baseline assessments, two withdrawn before the start of the CFI due to symptoms improvement, two dropped out before the start of the CFI and three dropped out during the CFI. Data for 10 participants who completed the study was included in data analysis. Results: PTSD symptoms: Across all participants, the mean pre-post change was -27.30 with large effect size (SD = 14.96, range 0 to -52, d = 1.1), and the mean pre-FU change was -31.40 with huge effect size (SD = 14.18, range -12 to -58, d = 2.26). At post-test and 4-week FU, 10 individuals no longer met criteria for PTSD on the PCL-5.</td>
<td>Strengths: Randomizing participants to baseline periods of varying lengths. Frequent assessments. Participants had stable or worsening symptomatology during baseline. Large effect sizes across participants. Limitations: No an active control condition. The influence of therapist specific effects, demand characteristics, or observer effects. High dropout during baseline and after starting treatment. Seventeen people enrolled for the study but 10 completed the intervention. Per-protocol analysis used. Small sample size for correlation analysis.</td>
<td>EPHPP: A: WEAK B: MODERATE C: N/A D: WEAK E: STRONG F: WEAK Global: WEAK</td>
</tr>
</tbody>
</table>
Shame: Across all participants, the mean pre-post change was -36.50 with large effect size (SD = 20.51, range -1 to -62, d = 1.03). The mean pre-FU change was -40.40 with huge effect size (SD = 19.76, range -9 to -66, d = 2.12).

Self-Compassion: Mean pre-post change was 1.53 with very large effect size (SD = .99, range .13 to 3.13, d = 1.46), and mean pre-FU change was 1.84 with huge effect size (SD = 1.48, range -.20 to 3.66, d = 2.26).

Self-blame: Mean pre-post change was -2.68 with very large effect size (SD = 1.44, range -.20 to -4.60, d = 1.31) and mean pre-FU change was -3.20 with huge effect size (SD = 1.48, range -.20 to -4.80, d = 2.61).

Mechanism:
Greater pre-post increases in SC were associated with greater pre-post reductions in shame (r = -.80, p < .01), PTSD symptoms (r = -.74, p < .05) and self-blame (r = -.78, p < .01).

Greater pre-FU on the SCS correlated with larger decreases in and self-blame (r = -.78, p < .01), PTSD symptom severity (r = -.76, p < .05) and shame (r = -.79, p < .01).

Authors’ Conclusions: The compassion-based intervention is associated with reductions in PTSD symptoms and trauma-related shame. BSCT is a promising either as a stand-alone treatment or as an addition to other treatments.

2. Lawrence & Lee (2014)
Participants were five females and two males who had completed a course of CFT with focus on their PTSD and trauma.

Diagnostic: All participants met DSM-IV TR, criteria for PTSD

Outcome: Qualitative descriptions of Intervention: Four participants completed CFT in a group format, and three individuals CFT. The study looked at their experiences of CFT for trauma and

Study Design: A qualitative research design. Semi-structured interviews were conducted to collect data. Interpretative Phenomenological Analysis used. The questions were focused on barriers experienced by participants during CFT and changes that they had experienced as a result of it.

Withdrawals and dropouts: None

Strengths: Clinical sample. Direct and in-depth exploration of individuals’ experience of CFT for trauma. Reflexivity and credibility checks.

Limitations: CASP 9.5/10
Global: STRONG
All met DSM-IV TR, criteria for PTSD. 
\((N = 7)\)

changes in self-criticism, hopelessness and self-compassion related to participation in CFT for trauma.

changes participants had experienced as a result of therapy. 

Interviews were 45-90 minutes long.

Comparator: None

Results: Participants were reluctant to stop being self-critical and experienced "highly aversive emotional responses" to the idea of developing SC. Gaining "a sense of common humanity" in therapy helped them shift from rejecting to accepting SC. Believing and feeling compassion for themselves helped participants to accept SC and have a more compassionate relationship with themselves. SC had a "tempering effect" on self-criticism. SC led to positive affect which reduced self-criticism and led to better relationships with themselves and increased sense of hopefulness. Participants also felt more accepting and deserving of positive affective states.

Authors’ Conclusions: Evidence for using CFT with people who have PTSD, are self-critical and have low levels of SC. Overcoming the fear of SC is a complex and difficult process and an important step in CFT. This leads to development of SC and reduction in self-criticism. Soothing and contentment system can be activated for those with low SC but clients may find this work frightening and difficult at the beginning.

Participants had a range of traumatic experiences (e.g., from discrete events to repeated trauma) so may not be generalizable to others with PTSD. No psychometric measures of constructs of interest therefore difficult to measure change objectively.


A 58-year-old male with a recent trauma and associated psychological distress and somatic symptoms. Pre-therapy scores on IES-R: avoidance 28, hyperarousal 15 & Intrusion 25 (a cut-off score of 33) \((N = 1)\)

Diagnostic: IES-R DES II

Outcome: SCS-SF 
Qualitative descriptions of shame and guilt

Intervention: EMDR combined with CMT. CMT used to help the client develop self-compassion, deal with feelings of shame and self-criticism while exploring the trauma event. CMT interweaved in eight EMDR sessions.

Comparator: None

Study design: Mixed method study. A case study

Withdrawals and dropouts: None

Results: Client reported that CMT helped him develop compassionate attitude towards himself and reduce feelings of shame and self-critical thoughts following traumatic events. 

Increase in SCS scores from pre-therapy \((M = 1.96)\), Mid-therapy \((M = 2.72)\), Post-therapy \((M = 3.71)\) to 9 moth follow-up \((M = 3.74)\). A score of 1-2.5 on SCS (with maximum 6) indicates low self-compassion, 2.5-3.5 moderate self-compassion, and 3.5-5.0 high self-compassion (Neff, n.d.)

Strengths: In depth investigation of a client’s experience. Psychometric measures with good psychometric properties.

Limitations: Difficult to determine unique contributions of EMDR and CMT as they were interweaved. No quantitative measures of shame

EPHP: A: MODERATE 
B: WEAK 
C: N/A 
D: WEAK 
E: STRONG 
F: N/A 

CASP: 5.5/10 
Global: MODERATE

<table>
<thead>
<tr>
<th>Diagnostic:</th>
<th>The PCL-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome:</td>
<td>SCS TRGI TRSI</td>
</tr>
</tbody>
</table>

**Intervention:** Individuals attended 3 hour long intensive outpatient SUD treatment group sessions four times per week. The groups focused on 12-step principles and coping skills to help individuals with their craving for substances (e.g., alcohol).

Individuals attended BSCT groups in addition to regularly scheduled treatment activities.

BSCT is a structured, 4 x 60 minutes sessions group intervention, which includes practices

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**Decrease in IES-R Avoidance scores form pre-therapy = 28, Mid-therapy 17, Post-therapy = 5 to 9 months follow-up = 4**

**Decrease in IES-R Hyper-arousal scores form pre-therapy = 15, Mid-therapy 14, Post-therapy = 4 to 9 months follow-up = 6**

**Decrease in IES-R Intrusion scores form pre-therapy = 25, Mid-therapy 14, Post-therapy = 4 to 9 months follow-up = 5**

**Author’s Conclusions:** CMT can be effective as a resource in EMDR to help reduce shame related to traumatic events.

**Study design:** Cohort Pre & Post repeated measures.

**Withdrawals and dropouts:** Fifty participants completed intake assessments, 22 dropped out after first session, four after second session, three after third session and two did not complete post-treatment assessment. Data for 19 participants was included in analysis.

**Results:**

Total SC scores on the SCS with medium effect size ($d = .66$), as well as subscales of Kindness with large effect size ($d = .78$), Common Humanity with medium effect size ($d = .50$), and Mindfulness with medium effect size ($d = .49$) statistically significantly increased from intake to post-treatment assessment (all $p < .05$). Participants also had statistically significant decreases, with medium effect sizes, in over identification ($p < .05; d = -.50$) and isolation ($p < .05; d = -.62$).

Statistically significant decrease from intake to post-treatment on TRGI, Global Guilt Scores with medium effect size ($p < .01; d = -.70$), Guilt Cognitions with medium effect size ($p < .01; d = -.88$) and Guilt Distress with large effect size ($p < .01; d = .80$).

**Strengths:** Use of valid measures of constructs pre-and post intervention. Clinical Sample.

**Limitations:** Lack of an active comparison group. Small sample size. Mixed sample with different mental health difficulties. High drop out rate. No data on drop out reasons Comorbid SUD. Difficult to distinguish effects of SUD treatment and BSCT. Only self-reports used. Large number of t-tests with no adjustment of alpha criterion increased Type 1 error.

**EPHPP:**

A: MODERATE
B: MODERATE
C: N/A
D: WEAK
E: STRONG
F: WEAK

**Global:** WEAK
used in MSC and CFT.

**Comparator:** None

Total trauma-related shame scores on the TRSI with medium effect size ($d = -0.69$) and the IS with medium effect size ($d = -0.74$) statistically significantly decreased ($p < .05$) but the change in Externalized Shame was not significant.

No statistically significant changes in PTSD

**Authors’ Conclusions:**

Participants’ levels of SC statistically significantly increased, and their trauma-related shame and guilt statistically significantly reduced. Basic SC can be effectively taught in four weeks. SC practice can help reduce cognitions and emotions related to trauma-related guilt and shame.

*Note:* $N =$ number of participants; $f =$ female; $m =$ male; TLEQ, Traumatic Life Events Questionnaire; $r =$ Pearson correlation coefficient; $d =$ Cohen’s $d$; SC, Self-Compassion; SCS, Self-Compassion Scale; SCS-SF, Self-Compassion Scale-Short Form; PCL-5, PTSD Checklist for DSM-5; ISS, Internalized Shame Scale; PTCI, Posttraumatic Cognitions Inventory; CEQ, Credibility/Expectancy Questionnaire; MSC, Mindful-Self Compassion, CMT, Compassion Mind Training; PTSD, Post Traumatic Stress Disorder; SUD, Substance Use Disorder; IES-R, Impact of Events Scale-Revised; DES II, Dissociative Experiences Scale II; HADS, Hospital Anxiety and Depression Scale; VOC, The Validity of Cognition Scale; SUD, Subjective Units of Disturbance Scale; TRGI, The Trauma-Related Guilt Inventory; TRSI, The Trauma-Related Shame Inventory; EIS, The Emotional Intelligence Scale; MLQ, The Meaning in Life Questionnaire; DSM-IV TR, Diagnostic and Statistical Manual of Mental Disorders, 4th Edition Text Revision; BSCT, Brief Self Compassion Training; EMDR, Eye Movement Desensitisation Reprogramming;
Changes in Shame and Negative Cognitions of the Self

To answer the research question whether CFIs can reduce shame and/or negative cognitions of the self in people with PTSD, this review investigated changes in those variables related to receiving a CFI.

One study (1) reported a substantial reduction in shame and self-blame pre to post CFI and pre to post follow-up with authors reporting very large and huge effect sizes respectively, according to Sawilowsky’s (2009) classification. The study however had a high drop out rate with less than 60% completing the study. The average drop out of people with PTSD from other interventions for PTSD, such as exposure treatments, is 20.5%, combinations of exposure and other CBT techniques is 26.9%, and EMDR is 18.9% (Hembree, Foa, Dorfan, Street, & Kowalski, Tu, 2003). Therefore, this raises a question as to whether the sample was representative and whether the intervention was feasible for a PTSD population.

Similar to study 1, another study (4) reported medium effect sizes, according to Cohen’s (1988) criteria, for reductions in trauma-related shame as measured by the total score on TRSI and the internalized shame subscale. In addition, the study showed medium effect sizes from pre to post treatment on TRGI, Global Guilt Scores, Guilt Cognitions and Guilt Distress. However, the study used a large number of t-tests and no adjustment of alpha criterion, therefore increasing the Type 1 error. It also had high dropouts, all participants had co-morbid SUD and the study used a mixed clinical sample, meaning that the results have been influenced by data from participants with different clinical diagnoses making it less generalizable to a PTSD population. The sample in this study had received treatment for SUD, resulting in contamination of the compassion-based intervention (Magill, Knight, McCrone, Khalida, & Landau, 2019) and co-intervention effects (Krishna, Maithreyi, &
Surapaneni, 2010), making it difficult to distinguish the effect of the CFI from the effect of the treatment for SUD.

A case study (3) showed that the client reported CMT helped him develop a compassionate attitude towards himself and reduce feelings of shame and self-critical thoughts. However, this study did not include psychometric measures of those constructs and did not provide enough information about the baseline levels of shame and self-criticism, making it difficult to draw conclusions regarding the effects of CFI on those variables. Also, as EMDR was used in combination with CMT, it is difficult to distinguish the separate effects of those two interventions in relation to shame and self-criticism, especially knowing that EMDR alone can reduce feelings of shame (Balcom, Call, & Pearlman, 2000). Another criticism is that the study did not acknowledge and manage the researcher bias (e.g., lack of reflexivity checks) despite the therapist being the researcher; therefore, the results may have been affected by the researcher’s preexisting expectations and assumptions (Peterson, 2019).

In contrast, a qualitative study rated as strong (2) demonstrated that individuals may initially develop “highly aversive emotional responses” to developing self-compassion. The description of the aversive emotional response resonates with Gilbert, McEwan, Matos, and Rivis’ (2011) definition of the fear of self-compassion, characterized by resistance to engage in compassionate experiences and fear of affiliative emotions. However, the research also showed that with practice, individuals began to accept self-compassion and develop a more compassionate relationship with themselves. The compassionate attitude reduced participants’ self-criticism and helped them feel more deserving and accepting of positive affective
states. This study provides some evidence on CFI’s potential for reducing self-criticism in people with PTSD; however, it did not investigate shame.

**Processes and Mechanisms**

This review investigated whether increases in self-compassion, following CFI, correspond to changes in shame, negative cognitions of the self and/or PTSD symptoms in a PTSD population. The findings show that although none of the studies aimed at studying processes and mechanism of CFI in PTSD, they showed that the increase in self-compassion corresponds to reduction in shame (1, 3, 4), self-blame (1), guilt (4) and self-criticism (1, 2, 3, 4). Moreover, all studies with quantitative measures showed substantial increases in self-compassion levels. This was demonstrated in study 1 by pre to post CFI change in SCS scores indicating very large effect size and pre-FU huge effect size. In study 3 there was a change in mean scores on SCS from pre-therapy, indicating low self-compassion, to post-therapy and follow-up indicating high self-compassion levels. In study 4 the changes in SCS from pre to post CFI indicated medium effect size, subscales of Kindness showed large effect size and medium effect size for Common Humanity and Mindfulness ($d = .49$). However, none of the studies had a RCT design to establish the efficacy of the CFI. Interestingly, some studies showed that participants did not meet PTSD criteria following CFI (1, 3) but one study found no significant changes on PTSD measure (4) and one did not include this information (2). Only one study (1) directly investigated the association between change in PTSD and negative self (shame, self-criticism) or self-compassion. None of the studies used statistical mediation analyses to investigate if change in negative self or self-compassion mediates the effect of CFI on PTSD symptom reduction.
Overall, the studies show that there is some preliminary evidence that development of self-compassion may lead to reductions in shame, negative cognitions of the self and PTSD symptoms in people with PTSD. However, due to the small number of studies, the overall weak study methodology, lack of RCTs, heterogeneous study design methods, lack of control groups and inferential statistical analysis, as well as inconsistent measures of shame and negative cognitions constructs, it is difficult to establish the effects of CFI on PTSD outcomes. Also, as grey literature was not included in this review, the findings may be affected by publication bias. Given that studies with significant results are more likely to be published (Joober, Schmitz, Annable, & Boksa, 2012) the results of the current systematic review may be skewed.

**Discussion**

The aim of this systematic literature review was to investigate whether a) CFIs reduce shame and/or negative cognitions of the self in people with PTSD and b) whether increases in self-compassion, following CFI, correspond to changes in shame and/or negative cognitions of the self in a PTSD population.

The findings provide preliminary evidence that CFIs can lead to reductions of shame and negative cognitions of the self, such as self-criticism, self-blame and guilt. There is also partial evidence that those reductions correspond to increases in self-compassion and a decrease in PTSD symptoms. However, the results should be taken with caution due to a number of limitations with the existing evidence base. There is a lack of methodologically strong RCT that include a process or mechanism evaluation of changes in shame and negative cognitions of the self to understand how CFIs work on PTSD symptom reduction.
Theoretical and Clinical Implications

Despite the methodological critique, it is of note that all of the quantitative studies demonstrated CFIs increase self-compassion with large effects and this has a shame reducing effect, which reflects the previous research showing similar beneficial effects of CFIs (Frostadottir & Dorjee, 2019; Cuppage et al., 2018). Whereas a previous literature review showed that development of self-compassion leads to reductions in shame and self-criticism in transdiagnostic populations (Cuppage et al., 2018), this review highlighted that those reductions are also potentially applicable to people with PTSD. This is particularly important as high levels of shame are implicated in a PTSD population (Koenig, Youssef, & Pearce, 2019) and correlated with self-criticism (Harman & Lee, 2010). Self-criticism and shame can be a barrier to engagement with services (Gaudet, Sowers, Nugent, & Boriskin, 2016). However, it is important to note that the large effects are likely to be overestimated because of: a) publication bias, therefore inclusion of only published studies, which are more likely to have significant findings and b) quantitative studies using per-protocol analysis rather than intention to treat, therefore individuals who did not find CFIs beneficial may have dropped out before the end of the intervention.

The current review shows that using a compassion-focused model with people with PTSD may be promising because it can lead to significant reductions of shame, with medium to huge effect sizes. It therefore complements NICE guidelines (2018) as to the interventions that could be beneficial for people with PTSD who struggle to engage. However, although the effects for shame are medium to large they are all obtained in pre-to-post designs with no comparison with active treatment and no RCT included in the review. Furthermore, with high drop out and withdrawal rates in quantitative studies with no intention to treat analysis it is impossible to
establish how CFIs compare to other PTSD treatments. More research with stronger methodologies is needed to investigate that.

Despite the weak methodologies, the review findings are in line with Gilbert’s tripartite model of affect regulation and suggest development of the soothing system (Gilbert, 2009) in people with PTSD may be especially important as this group is known to have an increased threat system activation (APA, 2013). Similarly, developing the soothing system may decrease negative cognitions and self-appraisals, which contribute to maintenance of PTSD (Ehlers & Clark, 2000).

This review also highlights that by developing self-compassion and affiliative emotions, individuals with PTSD can activate their soothing system and downregulate the threat response (Gilbert, 2009; 2015), however, it is important to consider that individuals with PTSD and/or high levels of shame may need more time to develop self-compassion (Gilbert & Procter, 2006). In particular, one study (2) highlighted the aversive response experienced by people with PTSD when they were introduced to the concept of self-compassion. However, all of the studies showed an increase in self-compassion following a number of sessions. This means that several sessions may be needed before individuals are able to accept and begin developing self-compassion (Lawrence & Lee, 2014).

Limitations and Further Directions

One of the limitations of this literature review is that there has been limited research in this area therefore the review only included four articles. Those comprised various study designs, including qualitative and quantitative, making it difficult to compare the results across the studies. Additionally, there was a lack of RCT, which are the most appropriate to investigate the safety and efficacy of new
interventions and establishing whether there is a causal relationship between effects and intervention (Kabisch, Ruckes, Seibert-Grafe, & Blettner, 2011).

Correspondingly, none of the included studies had a control group or were blinded, making it difficult to establish the effect of the intervention and avoid researcher bias (Peterson, 2019). Similarly, all of the studies evaluated with EPHHP were rated as weak, meaning that their quality was low because of the potential biases (e.g., selection bias) and flaws in methodologies; therefore only limited conclusions can be drawn on the effects of the CFIs.

Secondly, there were weaknesses in terms of evaluating the evidence around the constructs of interest, shame and negative self, across the studies. This is because those were assessed in various ways or not assessed at all. For example, there was a lack of psychometric measures of self-criticism, some studies only used qualitative descriptions of the constructs, there was a heterogeneity of measures used to assess shame and only one study investigated self-blame and one guilt. This makes it difficult to establish the actual effect of CFIs on those variables. Further research is recommended using valid measures of self-criticism (Rose & Rimes, 2018) such as the Self-Critical Rumination Scale and/or any measure of post trauma cognitions such as The Posttraumatic Cognitions Inventory. This would help understand whether CFIs have a beneficial effect on other trauma cognitions that can hinder the recovery process as proposed by Ehlers and Clark (2000).

Thirdly, due to one study (3) using EMDR with interweaved Compassion Mind Training and another study (4) using CFI post substance misuse treatment, it may have been affected by the contamination (Magill, Knight, McCrone, Khalida, & Landau, 2019) and co-intervention effects (Krishna, Maithreyi, & Surapaneni, 2010). Given this, it is impossible to separate the effects of CFI from the effects of
other interventions and draw conclusions in terms of the direct effects on shame and negative evaluations. To better understand the efficacy of CFIs, effect sizes need to be determined (McGough & Faraone, 2009) in research comparing CFI alone with an active control group. Also, due to the heterogeneity of CFI as demonstrated by different protocols, intensity and lengths, further research is recommended establishing which CFI are most effective in reducing shame and negative cognitions of the self in people with PTSD.

**Strengths**

The small number of articles included in this review, despite a comprehensive literature search using relevant databases, indicated the limited state of the evidence in a clinically significant area and highlighted a research need. Even empty reviews with no articles are published (Yaffe, Montgomery, Hopewell, & Shepard, 2012) and are important because they highlight major research gaps, and show the current state of research evidence (Lang, Edwards, & Fleiszer, 2007) and can act as a trigger for a clinical trial (Cochrane, n.d.). Therefore the strength of this review is in identifying that despite the significant role of shame in PTSD and a potential beneficial effect of CFIs to diminish it, there is a lack of studies with strong methodologies, to evaluate the effectiveness of CFIs in people with PTSD.

This review also used PRISMA guidelines (Moher et al., 2015) with a comprehensive protocol to follow in order to systematically identify, include and evaluate relevant studies to answer the review question. It employed inter-rated reliability checks for inclusion/exclusion of articles and quality assessment and used valid tools to evaluate research evidence, decreasing the influence of biases.
Conclusions

The findings of this literature review demonstrate that there is some evidence that CFIs can lead to an increase in self-compassion and reductions in PTSD symptoms, shame and negative trauma cognitions (e.g., self-blame, guilt) in people with PTSD. However, due to the small number of studies included, and those having mainly weak methodologies, it is impossible to reliably establish the effect of CFIs on people with PTSD. Further research is recommended, comparing CFIs with an active control group and using valid measures of shame, self-criticism and post trauma cognitions.
References


Frostadottir, A. D., & Dorjee, D. (2019). Effects of Mindfulness Based Cognitive Therapy (MBCT) and Compassion Focused Therapy (CFT) on symptom change, mindfulness, self-compassion, and rumination in clients with


Westerman, G., McCann, E., & Sparkes, E. (2020). Evaluating the effectiveness of Mindfulness and Compassion-Based Programs on shame and associated psychological distress with potential issues of salience for adult survivors of


## Appendix A: PRISMA Checklist

<table>
<thead>
<tr>
<th>Section/topic</th>
<th>#</th>
<th>Checklist item</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rationale</td>
<td>3</td>
<td>Describe the rationale for the review in the context of what is already known.</td>
</tr>
<tr>
<td>Objectives</td>
<td>4</td>
<td>Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).</td>
</tr>
<tr>
<td><strong>METHODS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protocol and registration</td>
<td>5</td>
<td>Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.</td>
</tr>
<tr>
<td>Eligibility criteria</td>
<td>6</td>
<td>Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.</td>
</tr>
<tr>
<td>Information sources</td>
<td>7</td>
<td>Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.</td>
</tr>
<tr>
<td>Search</td>
<td>8</td>
<td>Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.</td>
</tr>
<tr>
<td>Study selection</td>
<td>9</td>
<td>State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).</td>
</tr>
<tr>
<td>Data collection process</td>
<td>10</td>
<td>Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.</td>
</tr>
<tr>
<td>Data items</td>
<td>11</td>
<td>List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.</td>
</tr>
<tr>
<td>Risk of bias in individual studies</td>
<td>12</td>
<td>Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.</td>
</tr>
<tr>
<td>Summary measures</td>
<td>13</td>
<td>State the principal summary measures (e.g., risk ratio, difference in means).</td>
</tr>
<tr>
<td>Synthesis of results</td>
<td>14</td>
<td>Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I²) for each meta-analysis.</td>
</tr>
</tbody>
</table>
### PRISMA 2009 Checklist

<table>
<thead>
<tr>
<th>Section/Topic</th>
<th>#</th>
<th>Checklist item</th>
<th>Reported on page #</th>
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<tbody>
<tr>
<td>Risk of bias across studies</td>
<td>15</td>
<td>Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).</td>
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<tr>
<td>Additional analyses</td>
<td>18</td>
<td>Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.</td>
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<tr>
<td><strong>RESULTS</strong></td>
<td></td>
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<tr>
<td>Study selection</td>
<td>17</td>
<td>Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.</td>
<td></td>
</tr>
<tr>
<td>Study characteristics</td>
<td>16</td>
<td>For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.</td>
<td></td>
</tr>
<tr>
<td>Risk of bias within studies</td>
<td>19</td>
<td>Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).</td>
<td></td>
</tr>
<tr>
<td>Results of individual studies</td>
<td>20</td>
<td>For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.</td>
<td></td>
</tr>
<tr>
<td>Synthesis of results</td>
<td>21</td>
<td>Present results of each meta-analysis done, including confidence intervals and measures of consistency.</td>
<td></td>
</tr>
<tr>
<td>Risk of bias across studies</td>
<td>22</td>
<td>Present results of any assessment of risk of bias across studies (see item 15).</td>
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<tr>
<td>Additional analysis</td>
<td>23</td>
<td>Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see item 16]).</td>
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<tr>
<td><strong>DISCUSSION</strong></td>
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<tr>
<td>Summary of evidence</td>
<td>24</td>
<td>Summarize the main findings including the strength of evidence for each main outcome, consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).</td>
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</tr>
<tr>
<td>Limitations</td>
<td>25</td>
<td>Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).</td>
<td></td>
</tr>
<tr>
<td>Conclusions</td>
<td>28</td>
<td>Provide a general interpretation of the results in the context of other evidence, and implications for future research.</td>
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<tr>
<td><strong>FUNDING</strong></td>
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<tr>
<td>Funding</td>
<td>27</td>
<td>Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.</td>
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</tbody>
</table>

Appendix B: EPHPP Quality Assessment Tool for Quantitative Studies

QUALITY ASSESSMENT TOOL FOR QUANTITATIVE STUDIES

COMPONENT RATINGS

A) SELECTION BIAS

Q1. Are the individuals selected to participate in the study likely to be representative of the target population?
1. Very likely
2. Somewhat likely
3. Not likely
4. Can’t tell

Q2. What percentage of selected individuals agreed to participate?
1. 80 - 100% agreement
2. 60 - 79% agreement
3. Less than 60% agreement
4. Not applicable
5. Can’t tell

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<td>2</td>
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B) STUDY DESIGN

Indicate the study design
1. Randomized controlled trial
2. Controlled clinical trial
3. Cohort analytic (two group pre + post)
4. Case-control
5. Cohort (one group pre + post (before and after))
6. Interrupted time series
7. Other specify
8. Can’t tell

Was the study described as randomized? If NO, go to Component C.
No
Yes

If Yes, was the method of randomization described? (See dictionary)
No
Yes

If Yes, was the method appropriate? (See dictionary)
No
Yes

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</table>
C) CONFOUNDERS

(Q1) Were there important differences between groups prior to the intervention?
1. Yes
2. No
3. Can’t tell

The following are examples of confounders:
1. Race
2. Sex
3. Marital status/family
4. Age
5. SES (income or class)
6. Education
7. Health status
8. Pre-intervention score on outcome measure

(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?
1. 80 – 100% (most)
2. 60 – 79% (somewhat)
3. Less than 60% (few or none)
4. Can’t Tell

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D) BLINDING

(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?
1. Yes
2. No
3. Can’t tell

(Q2) Were the study participants aware of the research question?
1. Yes
2. No
3. Can’t tell

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</table>

E) DATA COLLECTION METHODS

(Q1) Were data collection tools shown to be valid?
1. Yes
2. No
3. Can’t tell

(Q2) Were data collection tools shown to be reliable?
1. Yes
2. No
3. Can’t tell

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</table>
F) WITHDRAWALS AND DROP-OUTS

(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?
1. Yes
2. No
3. Can’t tell
4. Not Applicable (i.e. one time surveys or interviews)

(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).
1. 80-100%
2. 60-79%
3. less than 60%
4. Can’t tell
5. Not Applicable (i.e. Retrospective case-control)

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<th>Not Applicable</th>
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<tr>
<td>See dictionary</td>
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<td>2</td>
<td>3</td>
<td>Not Applicable</td>
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</table>

G) INTERVENTION INTEGRITY

(Q1) What percentage of participants received the allocated intervention or exposure of interest?
1. 80-100%
2. 60-79%
3. less than 60%
4. Can’t tell

(Q2) Was the consistency of the intervention measured?
1. Yes
2. No
3. Can’t tell

(Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?
1. Yes
2. No
3. Can’t tell

H) ANALYSES

(Q1) Indicate the unit of allocation (circle one)
- Community
- Organization/institution
- Practice/office
- Individual

(Q2) Indicate the unit of analysis (circle one)
- Community
- Organization/institution
- Practice/office
- Individual

(Q3) Are the statistical methods appropriate for the study design?
1. Yes
2. No
3. Can’t tell

(Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?
1. Yes
2. No
3. Can’t tell
GLOBAL RATING

COMPONENT RATINGS
Please transcribe the information from the gray boxes on pages 1-4 onto this page. See dictionary on how to rate this section.

<table>
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<tr>
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<th>SELECTION BIAS</th>
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<td>B</td>
<td>STUDY DESIGN</td>
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<tr>
<td>C</td>
<td>CONFOUNDERS</td>
<td>STRONG</td>
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<td>D</td>
<td>BLINDING</td>
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<td>E</td>
<td>DATA COLLECTION METHOD</td>
<td>STRONG</td>
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<td>F</td>
<td>WITHDRAWALS AND DROPouts</td>
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</table>

GLOBAL RATING FOR THIS PAPER (circle one):

1  STRONG (no WEAK ratings)
2  MODERATE (one WEAK rating)
3  WEAK (two or more WEAK ratings)

With both reviewers discussing the ratings:

Is there a discrepancy between the two reviewers with respect to the component (A-F) ratings?

  No  Yes

If yes, indicate the reason for the discrepancy

1  Oversight
2  Differences in interpretation of criteria
3  Differences in interpretation of study

Final decision of both reviewers (circle one):

1  STRONG
2  MODERATE
3  WEAK
Appendix C: CASP Qualitative Assessment

CASP Checklist: 10 questions to help you make sense of a Qualitative research

How to use this appraisal tool: Three broad issues need to be considered when appraising a qualitative study:

- Are the results of the study valid? (Section A)
- What are the results? (Section B)
- Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is “yes”, it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a “yes”, “no” or “can’t tell” to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA ‘Users’ guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Qualitative) Checklist. [online] Available at: URL. Accessed: Date Accessed.

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Section A: Are the results valid?

1. Was there a clear statement of the aims of the research?
   - Yes
   - Can’t Tell
   - No
   HINT: Consider
   - what was the goal of the research
   - why it was thought important
   - its relevance

Comments:

2. Is a qualitative methodology appropriate?
   - Yes
   - Can’t Tell
   - No
   HINT: Consider
   - if the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants
   - is qualitative research the right methodology for addressing the research goal

Comments:

Is it worth continuing?

3. Was the research design appropriate to address the aims of the research?
   - Yes
   - Can’t Tell
   - No
   HINT: Consider
   - if the researcher has justified the research design (e.g., have they discussed how they decided which method to use)

Comments:
4. Was the recruitment strategy appropriate to the aims of the research?

- Yes
- Can’t Tell
- No

HINT: Consider
- If the researcher has explained how the participants were selected
- If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study
- If there are any discussions around recruitment (e.g., why some people chose not to take part)

Comments:

5. Was the data collected in a way that addressed the research issue?

- Yes
- Can’t Tell
- No

HINT: Consider
- If the setting for the data collection was justified
- If it is clear how data were collected (e.g., focus group, semi-structured interview etc.)
- If the researcher has justified the methods chosen
- If the researcher has made the methods explicit (e.g., for interview method, is there an indication of how interviews are conducted, or did they use a topic guide)
- If methods were modified during the study, if so, has the researcher explained how and why
- If the form of data is clear (e.g., tape recordings, video material, notes etc.)
- If the researcher has discussed saturation of data

Comments:
6. Has the relationship between researcher and participants been adequately considered?

   - Yes
   - Can't Tell
   - No

   HINT: Consider
   - If the researcher critically examined their own role, potential bias and influence during (a) formulation of the research questions (b) data collection, including sample recruitment and choice of location
   - How the researcher responded to events during the study and whether they considered the implications of any changes in the research design

   Comments:

Section B: What are the results?

7. Have ethical issues been taken into consideration?

   - Yes
   - Can't Tell
   - No

   HINT: Consider
   - If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
   - If the researcher has discussed issues raised by the study (e.g., issues around informed consent or confidentiality) or how they have handled the effects of the study on the participants during and after the study
   - If approval has been sought from the ethics committee

   Comments:
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>Can't Tell</th>
<th>No</th>
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<tbody>
<tr>
<td>8. Was the data analysis sufficiently rigorous?</td>
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<tr>
<td>HINT: Consider</td>
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<tr>
<td>• If there is an in-depth description of the analysis process</td>
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<td>• If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data</td>
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<td>• Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process</td>
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<td>• If sufficient data are presented to support the findings</td>
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<td>• To what extent contradictory data are taken into account</td>
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<td>• Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation</td>
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**Comments:**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>Can't Tell</th>
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<tbody>
<tr>
<td>9. Is there a clear statement of findings?</td>
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<tr>
<td>HINT: Consider</td>
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<td>• If the findings are explicit</td>
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<td>• If there is adequate discussion of the evidence both for and against the researcher's arguments</td>
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<td>• If the researcher has discussed the credibility of their findings (e.g., triangulation, respondent validation, more than one analyst)</td>
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<tr>
<td>• If the findings are discussed in relation to the original research question</td>
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**Comments:**
Section C: Will the results help locally?

10. How valuable is the research?

HINT: Consider
- If the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g., do they consider the findings in relation to current practice or policy, or relevant research-based literature?
- If they identify new areas where research is necessary.
- If the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used.

Comments:
Appendix D: Submission Guidance for Clinical Psychology Review
GUIDE FOR AUTHORS

Submission checklist
You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:
• E-mail address
• Full postal address

All necessary files have been uploaded:
Manuscript:
• Include keywords
• All figures (include relevant captions)
• All tables (including titles, description, footnotes)
• Ensure all figure and table citations in the text match the files provided
• Indicate clearly if color should be used for any figures in print
Graphical Abstracts / Highlights files (where applicable)
Supplemental files (where applicable)

Further considerations Manuscript has been 'spell checked' and 'grammar checked' All references mentioned in the Reference List are cited in the text, and vice versa Permission has been obtained for use of copyrighted material from other sources (including the Internet) A competing interests statement is provided, even if the authors have no competing interests to declare
• Journal policies detailed in this guide have been reviewed Referee suggestions and contact details provided, based on journal requirements Ensure manuscript is a comprehensive review article (empirical papers fall outside the scope of the journal) Ensure that reviews are as up to date as possible and at least to 3 months within date of submission

For further information, visit our Support Center.

BEFORE YOU BEGIN

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Please see our information pages on Ethics in publishing and Ethical guidelines for journal publication.

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Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Articles should make no assumptions about the beliefs or commitments of any reader, should contain nothing which might imply that one individual is superior to another on the grounds of race, sex, culture or any other characteristic, and should use inclusive language throughout. Authors should ensure that writing is free from bias, for instance by using ‘he or she’, ‘his/her’ instead of ‘he’ or ‘his’, and by making use of job titles that are free of stereotyping (e.g. ‘chairperson’ instead of ‘chairman’ and ‘flight attendant’ instead of ‘stewardess’).

Author contributions
For transparency, we encourage authors to submit an author statement file outlining their individual contributions to the paper using the relevant CRediT roles: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; Writing - review & editing. Authorship statements should be formatted with the names of authors first and CRediT role(s) following. More details and an example

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Authors are expected to consider carefully the list and order of authors before submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only before the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the corresponding author: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed. Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors after the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

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Statement 1: Role of Funding Sources
Authors must identify who provided financial support for the conduct of the research and/or preparation of the manuscript and to briefly describe the role (if any) of the funding sponsor in study design, collection, analysis, or interpretation of data, writing the manuscript, and the decision to submit the manuscript for publication. If the funding source had no such involvement, the authors should so state.

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Authors must declare their individual contributions to the manuscript. All authors must have materially participated in the research and/or the manuscript preparation. Roles for each author should be described. The disclosure must also clearly state and verify that all authors have approved the final manuscript.

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Appendix E: Dissemination Plan

The results of this research will be disseminated through feedback, presentation and journal publication.

Journal Publication

It is expected that this systematic review will be submitted to Clinical Psychology Review in September 2020 for dissemination to a wide academic audience.

Presentation

This systematic review will be presented to trainee clinical psychologists and staff from the Exeter DClinPsy programme in June 2020.
School of Psychology

Doctorate in Clinical Psychology

Empirical Paper

Immediate Psychophysiological Effects of Induced Self-compassion State on Experience of Shame Following a Psychosocial Stress Test.

Trainee Name: Aleksandra Laszczynska

Primary Research Supervisor: Professor Anke Karl

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Secondary Research Supervisor: Dr Nicholas Moberly Dr Ian Frampton

(Until March 2020) (From March 2020)

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Target Journal: Behaviour Research and Therapy

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Abstract

Despite emerging evidence indicating that self-compassion can have protective effects against shame and self-criticism, there is a lack of studies investigating direct effects of self-compassion on state shame and self-criticism when exposed to social stress. This study addressed this gap and investigated, in 62 healthy individuals, whether a brief Loving Kindness Meditation to self (LKM-S, n = 32), known to temporarily increase state self-compassion, can attenuate psychophysiological responses to a psychosocial stress test (Montreal Imaging Stress Task [MIST]) as compared to a neutral emotion induction (NEU, n = 30). An experimental design was used with self-report measures of shame, self-criticism and self-compassion as well as physiological measures of heart rate (HR), skin conductance level (SCL) and heart rate variability (HRV). It was investigated whether LKM-S has a protective effect in terms of reducing state shame and self-criticism when participants were exposed to MIST as compared to NEU. It was hypothesized that participants from LKM-S will have lower scores on state shame and self-criticism post MIST and higher self-compassion levels post MIST in LKM-S as compared to NEU. Additionally, the research used markers of sympathetic and parasympathetic variables to investigate whether LKM-S attenuated physiological responses to MIST. None of the described hypothesis were confirmed. The findings suggest that a brief one-off self-compassion intervention, although it temporarily increased self-reported self-compassion, is not sufficient to protect against shame and self-criticism in the context of a psychosocial stressor.

Keywords: Self-compassion, shame, self-criticism, physiology, Heart Rate Variability, The Montreal Imaging Stress Task


Introduction

Shame is a self-conscious emotion, experienced when the aspect of the self is judged as inferior, defective and/or inadequate (Gilbert, 1997). High dispositional levels of shame (trait shame) are implicated in the development and maintenance of psychological distress (Clapton, Williams, & Jones, 2018) and mental health difficulties (Saraiya & Lopez-Castro, 2016). People with high levels of shame may feel devalued and scrutinized by others making them hyper-vigilant to perceived criticism and judgment (Zaslav, 1998). Shame can also decrease positive treatment outcomes (Kelly, Carter, & Borairi, 2014), lead to discontinuation of psychotherapy (Dunn, Delfabbro, & Harvey, 2012) and prevent individuals from disclosing traumatic experiences (Lemaigrea, Taylorb, & Gittoesc, 2017), all of which are crucial to improvement in well-being.

A model promoting development of self-compassion can be used to work with shame and negative self-perception (Gilbert, 2005). Self-compassion is being kind and understanding towards oneself in difficult times (Neff, 2011). Research shows distinctive biological responses to social stress (Guez, Saar-Ashkenazy, Keha, & Tiferet-Dweck, 2016; Kudielka, Schommer, Hellhammer, & Kirschbaum, 2004), associated with shame (Dickerson & Kemeny, 2004), and self-compassion (Arch et al., 2014).

Self-compassion is negatively correlated with shame (Johnson & O'Brien, 2013) and helps reduce high levels of shame in individuals with PTSD (Au et al., 2017). However, the mechanisms of self-compassion and the direct psychophysiological effects of self-compassion on shame, are still not well understood.
One possible avenue for a better understanding is to study the effects of a short-term experimental self-compassion exercise on shame, complementing self-report with psychophysiological variables. Before reviewing the evidence, we will begin with definitions of shame and self-compassion and progress into an elaboration of the relevance of those two constructs to stress reactivity.

**Shame and Self-criticism**

Shame is a self-conscious emotion elicited by negative self-appraisal (Tangney & Tracey, 2012) with a self-criticism component, where in shame-inducing situations, an individual may become devaluing and critical towards oneself (Gilbert & Procter, 2006). Gilbert (2010) defines self-criticism as a safety strategy to deal with and/or avoid feelings of shame.

Shame is an inner experience focused on a person’s self-worth, negative self-evaluation, and concerns regarding how one’s defects will be seen by others (Tangney & Dearing, 2002). Whilst there is an adaptive quality of shame such as escaping potential threat (Dickerson & Gruenewald, 2004), persistent experience and high levels of trait shame may have detrimental consequences for well-being. Shame may lead to individuals viewing themselves as worthless and inferior (Van Vliet, 2008).

Dickerson, Gruenewald and Kemeny (2004) proposed the social self-preservation model which postulates that threats to a social self are accompanied by a specific psychological and physiological response such as increases in shame and sympathetic nervous system activity. The threats to the social self include situations in which an aspect of an individual’s identity is exposed and negatively judged by others (Dickerson & Kemeny, 2004).
Psychosocial evaluative stress can occur when an individual is evaluated and judged on the basis of their performance (e.g., cognitive tests). Robertson, Sznycer, Delton, Tooby and Cosmides (2018) demonstrated that actual or potential devaluation by others elicits shame and shame can be triggered by negative perceptions of the self by others.

Persistent experience of shame is detrimental to wellbeing and shame is implicated in depression (Cheung, Gilbert, & Irons, 2004), eating disorders (Duarte, & Ferreira, 2016) and PTSD (Saraiya & Lopez-Castro, 2016). Therefore, it is important to research shame and potential constructs or interventions that may protect against or reduce excessive feelings of shame such as self-compassion.

Self-compassion

Neff (2003a) proposed three components of self-compassion: self-kindness — being understanding, kind and nonjudgmental towards oneself in instances of failures; common humanity — recognizing that suffering is a part of the human experience; and mindfulness — being aware and receptive of painful thoughts and feelings.

Neff (2003a; 2011) suggested the qualities of self-compassion protect against the negative consequences of self-judgement. Correspondingly, self-compassion is negatively correlated with shame (Johnson & O'Brien, 2013), self-criticism (Neff, 2003a), and increased levels of self-compassion are linked to lower levels of mental health symptoms (MacBeth & Gumley, 2012).

Shame and Self-compassion in the Affect Regulation Model

Gilbert (2009) proposed a model of affect regulation (see Figure 1) which includes “Threat”, “Incentive and resource-seeking” and “Soothing” systems.
Figure 1. The interaction between the three affect regulation systems adopted from Gilbert (2009)

The threat system recognizes and alerts an individual against a threat to protect them from harm. The incentive system motivates an individual to achieve whereas the soothing system helps one to feel safe, experience positive affect and alleviate feelings of threat (Gilbert, 2009).

Compassion Focused Therapy (CFT) helps people with high levels of shame to develop and cultivate a more compassionate attitude towards themselves (Gilbert, 2014; Judge, Cleghorn, McEwan, & Gilbert, 2012). Compassionate Mind Training (CMT; Gilbert, 2010), a part of CFT, helps individuals develop emotional experiences...
of warmth and safeness via different self-compassion techniques. For example, Loving Kindness Meditation (LKM) increases feelings of warmth and compassion for the self and others (Salzberg, 1995). LKM also increases daily self-reported experiences of self-acceptance and contentment (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008), and self-compassion (Smeets, Neff, Alberts, & Peters, 2014; Boellinghaus, Jones, & Hutton, 2014). However, individuals with high levels of self-criticism (Barnhofer, Chittka, Nightingale, Visser, & Crane, 2010) or shame may find it initially difficult to cultivate self-compassion (Gilbert, 2009).

**Self-compassion, Shame, Self-criticism and Social Stress Reactivity**

Self-compassion may help individuals be more kind and understanding towards themselves in distressing situations (Neff, 2003a). Indeed, Leary, Tate, Adams, Allen and Hancock (2007) showed that participants who were asked to recall negative life events (e.g., involving failure and humiliation) were less distressed by this than the control group if they received self-compassion induction before recalling these events. Thus showing that self-compassion is an important factor that moderates reactions to distressing situations.

Self-compassionate individuals are less likely to experience anxiety following stressful situations (Allen & Leary, 2010) and individuals higher in trait self-compassion report less shame and stress following a psychosocial stress (Ewert, Gaube, & Geisler, 2018). However, the immediate protective effects of state self-compassion in relation to psychosocial stress are yet to be understood. Investigating immediate effects of self-compassion with psychosocial stress, after receiving self-compassion induction, would improve an understanding of whether self-compassion techniques used alone may be sufficient to induce some protective effects of self-
compassion in relation to social stress or whether longer-term work is needed to achieve that.

Through self-compassion, individuals may develop emotional experiences of safeness and contentment thereby activating their soothing system (Gilbert, 2010). This state of contentment is associated with an increased parasympathetic activity which is expressed by Heart Rate Variability (HRV), the beat-to-beat variability in heart rate (Porges, 2007) and can be achieved by practice of compassionate-based exercises (Kirby, Doty, Petrocchi, & Gilbert, 2017; Kirschner et al., 2019). Increased HRV is linked to the emotional state of compassion (Stellar, Cohen, Oveis, & Keltner, 2015; Kirschner et al., 2019) and a feeling of perceived safeness and warmth (Petrocchi et al., 2017).

Loving-kindness meditation for the self (LKM-S) was shown to increase self-reported levels of state self-compassion and positive affiliative affect which corresponded to an increased parasympathetic activity indicated by higher HRV, and decreased sympathetic activity indicated by decreased Heart Rate (HR) and lower Skin Conductance Level (SCL; Kirschner et al., 2019). This compassionate state facilitates engagement with distress, while preventing the threat-related physiological responses (Gilbert, 2014).

Perceived threat or exposure to psychosocial stress is linked to an increased sympathetic activity resulting in higher HR and SCL (Bradley & Lang, 2000; Mauss & Robinson, 2009; Guez et al., 2016; Kudielka et al., 2004).

One way of investigating immediate effects of self-compassion on psychosocial stress is inducing the stress by using a Psychosocial Stress Test (PST) in experimental conditions. The Trier Social Stress Test (TSST), which requires participants to deliver a presentation to a panel of assessors and induces
psychosocial stress (Birkett, 2011) was used in the previous studies (Arch et al., 2014; Ewert et al., 2018). However, for this research, the less resource-demanding alternative will be used, Montreal Imaging Stress Task (MIST), which also reliably provokes psychosocial stress in laboratory conditions (Martens, Tunbridge, & Harrison, 2017).

Arch et al. (2014) demonstrated that LKM practice diminished psychobiological responses to PST, which were indicative of lower stress, such as dampened sympathetic nervous system reactivity, more adaptive parasympathetic HRV and reduced self-reported anxiety. However, the study did not explore shame in relation to the task. This was addressed by Ewert et al. (2018) who investigated the impact of trait self-compassion on perceived stress and shame in reaction to PST. The study demonstrated that dispositional self-compassion predicted less self-reported stress and shame following the PST. However, the study has some limitations, such as using the Positive and Negative Affect Schedule, which is a general measure of positive and negative affect rather than shame specifically (Crawford & Henry, 2004) and the use of only self-report measures of stress and shame, meaning that participants’ responses may be affected by demand characteristics (Nichols & Maner, 2008). Therefore, a clear conclusion regarding the effects of self-compassion on shame could not be drawn.

Investigating the impact of LKM-S on state shame would enable an exploration of the direct impact of self-compassion on shame, as measured by psychophysiological variables, potentially leading to a better understanding of the protective mechanism of self-compassion in relation to shame.
Aims

A literature review identified a need for a better understanding of mechanisms of self-compassion (Zessin, Dickhäuser, & Garbade, 2015) and there is a relative lack of studies investigating the physiological components of shame (Saraiya & Lopez, 2016). Also, there is no research investigating psychophysiological effects of self-compassion on shame and existing studies on shame and self-compassion were mainly correlational, implemented self-report measures or did not investigate both self-compassion and shame in experimental conditions to explore the direct and immediate effect of self-compassion on shame. This study therefore will address those limitations and use psychophysiological measures to investigate the direct effect of self-compassion state, by manipulating it experimentally, on reactivity to a PST. This will facilitate an exploration of the effects of state self-compassion on state shame, allowing a better understanding of how self-compassion operates across psychobiological domains in relation to shame.

This study will investigate sympathetic (HR and SCL) and parasympathetic reactivity (HRV) in response to a PST (MIST) throughout the experiment to ascertain whether experimentally induced self-compassion prior to the PST will attenuate responses to this task. HR, SCL and HRV are reliable measures of sympathetic and parasympathetic activity (Jung et al., 2000; Sokolov, 1963; Thayer & Lane, 2000) and MIST reliably induces stress (Martens, Tunbridge, & Harrison, 2017). It is unknown whether MIST also induces shame, however, Eyre (2002) demonstrated that experience of inferiority due to perceived own incompetence can provoke shame. Given the psychosocial stress component of MIST with negative feedback and definite failure in the task, it is expected that due to unfavorable social evaluation
and social threat the participants will experience state shame (Dickerson & Kemeny, 2004). As participants may naturally vary in trait self-compassion and shame proneness, those measures were collected prior to the experimental procedure to ensure that the groups did not significantly differ in those traits.

**Research Question**

Does a brief self-compassion meditation reduce reactivity to a psychosocial stress task as measured by self-reports of shame and self-criticism and psychophysiological variables?

**Hypotheses**

Primary hypothesis:

1. State shame and self-criticism will decrease for participants from LKM-S pre-to-post audio recording but will remain the same for participants from NEU. State shame and self-criticism will significantly increase for NEU pre-to-post MIST but not for LKM-S. Pre-to-post MIST change will be significantly lower for LKM-S group than that in NEU. NEU will have a much stronger reaction to MIST as measured by
   a. self-reports of state shame
   b. and self-criticism.

2. The levels of self-reported self-compassion will decrease for both groups post MIST, however participants from LKM-S will have significantly higher self-reported self-compassion than NEU post audio recording and post MIST.
Secondary hypothesis:

3. Compared to NEU group, participants from the LKM-S condition will show decreased social stress reactivity during MIST indicated by
   a. reduced SCL and HR
   b. increased HRV.

Methods

Design

A mixed 2 x 2 design was used with a between-subjects factor of condition (LKM-S and NEU) and a repeated-measures factor of time (post audio recording, post MIST). The independent variable was the group and the dependent variables were the scores on self-reported measures (state self-compassion, shame, self-criticism and distress) and mean HR, HRV, and SCL. Participants were randomly assigned to groups using a random number generator (https://www.randomizer.org/).

Participants

Participants were staff and students, with no mental health difficulties, from the University of Exeter and were recruited through the research participation system (SONA), social media, word of mouth and posters. The final sample (see Figure 2) of 62 consisted of 48 females and 14 males (\(M = 22.15\) years, \(SD = 5.35\) years, range = 18 - 41 years) who were naïve to self-compassion meditation. Participants received course credits or £5 for their participation and were entered into a prize draw for a £50 Amazon voucher. The University of Exeter ethics board approved the study (see Appendix A) and all participants received an information sheet (see
Appendix B), provided written informed consent (see Appendix C) and were debriefed at the end of the experimental session (see Appendix D).

Figure 2. Participant enrolment process and assignment to Loving Kindness Meditation to Self (LKM-S) and Neutral Emotion Induction (NEU) groups
Inclusion and exclusion criteria. Inclusion criteria were: age 18 or older and native English speaker. Exclusion criteria were: current mental health difficulty and cardiovascular problems that could affect psychophysiological measurements. Individuals with the screening questionnaires indicating clinically significant symptoms were excluded from the study, debriefed via email and signposted to their GP and/or the Student Wellbeing Centre. Participants were asked to abstain from tobacco, caffeine, alcohol, and exercise in the two hours prior to the experiment.

Power analysis and determination of sample size. Sample size for Hypothesis 1 and 2 was determined following a-priori power calculation using G*Power (version 3.1.3; Faul, Erdfelder, Buchner & Lang, 2009) for mixed Analysis of Variance (ANOVA) with group (LKM-S, NEU) as between-subjects factor and time (pre, post) as within-subjects factor assuming a medium effect size in the absence of previous research and a conservative statistical power of .95 (see Appendix E). This revealed that 54 participants were required. For Hypothesis 3, this sample size is deemed sufficient as SCL, HR and HRV means were determined per minute (11 minutes for LKM/NEU; 6 minutes for MIST) thus increasing statistical power.

Measures and Materials

Screening measures. See Appendix F for screening measures. The Patient Health Questionnaire-8 (PHQ-8; Kroenke, Spitzer, & Williams, 2001) is a 9-item measure of depressive symptoms; however for the purpose of this study the suicidality question was removed. Items are scored from 0 (not at all) to 3 (nearly every day), with a maximum score of 27. It has excellent internal (α = .89) and test re-test reliability (α = .84). Scores of 10 or greater indicate depression therefore this cut-off was used for participant exclusion criteria.
Generalized Anxiety Disorder Scale 7 (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006) is a measure for anxiety-related symptoms and has reasonable sensitivity and specificity as a screening tool for anxiety disorders (Kroenke, Spitzer, Williams, Monahan, & Löwe, 2007). Items are scored from 0 (not at all) to 3 (nearly every day) with a maximum score of 21. It has excellent internal (α = 0.91) and test-retest reliability (intraclass correlation coefficient [ICC] = 0.83; Spitzer et al., 2006). A score of 10 indicates a clinically significant condition therefore this cut-off was used for participant exclusion criteria.

**Trait measures.** See Appendix G for trait measures. The Self-Compassion Scale (SCS; Neff, 2003b) is a 26-item measure rated on a five-point Likert-type scale (from 1 = never to 5 = always). The scale measures six dimensions of compassion: mindfulness, over-identification, self-kindness, self-judgement, common-humanity and isolation. A total self-compassion score comprises the sum of the subscale scores with a maximum score of 130 with the higher scores indicating a greater self-compassion. The SCS has good test–retest reliability (Cronbach’s alpha = .93) and internal consistency (Cronbach’s alpha = .92).

The Guilt and Shame Proneness scale (GASP; Cohen, Wolf, Panter, & Insko, 2011) measures individual differences in the tendency to experience guilt and shame. It contains four 4-item subscales: Guilt-Negative-Behavior-Evaluation, Guilt-Repair, Shame-Negative-Self-Evaluation (GASP-NSE), and Shame-Withdraw (GASP-SW). It has acceptable internal consistency (Cronbach’s alpha ranging between .62 and .71 for the four subscales). For this research, the GASP-NSE and GASP-SW scales were used. However due to an administration error only two items
were recorded for GASP-NSE and three for GASP-SW. Those were added to create a total for each subscale. The higher scores indicate higher proneness to shame.

The Forms of Self-Criticizing/Attacking Reassuring Scale (FSCRS) (Gilbert, Clarke, Hempel, Miles, & Irons, 2004) is a 22-item self-criticism trait scale with items about self-criticism and negative feelings about oneself in relation to failure. It also comprises items assessing self-supportive thinking in context of failure. The FSCRS has good psychometric properties such as internal consistency (e.g., Cronbach’s alpha ranging from .85 to .90 for the scales; Baiao, Gilbert, McEwan, & Carvalho, 2015).

**State Measures.** See Appendix H for state measures. The Experiential Shame Scale (ESS; Turner, 1998) measures physical, emotional, and social markers of shame. It has acceptable inter-item consistency (Cronbach alpha = .72) and convergent validity (Turner, 2014). The ESS does not name shame explicitly reducing avoidance to report shame feelings. It is made of a 7-point scale for each item describing two opposite states (e.g., clear, confused). Participants are asked to chose a number between 0 (*clear*) to 7 (*confused*) representing their current state. The items were developed to represent phenomena shown to be related to shame in prior research (Mikulincer & Florian, 1997). The ESS has low face validity therefore does not trigger socially-desirable responses (Turner, 2014). The scores for all scales are added to derive a total score with higher scores indicating higher levels of state shame.

ESS Distress (Turner, 1998) is one subscale from the ESS measuring distress used in a manipulation check to investigate whether PST induced distress. The measure is made of a 7-point scale for distress. Participants were asked to
chose a number between 0 \textit{(feeling content)} to 7 \textit{(feeling distressed)} representing their current emotional state.

Visual Analogue Scale (VAS; adapted from Kirschner et al., 2019) was used to measure state levels of self-compassion and self-criticism. Self-compassion composite (SC Composite) was created by calculating mean VAS scores of Compassion, Kindness and Understanding, and Tolerance, which are aspects of self-compassion (Neff, 2003b). Each VAS was designed to measure the subjective intensity of aspects of self-compassion and was based on the SCS. VASs have sliding scales between 0 \textit{(lowest subjective intensity)} and 100 \textit{(highest subjective intensity)}.

**Experimental manipulations.** Loving Kindness Meditation to Self (LKM-S; Kirschner et al., 2019) was used as the self-compassion induction (see Appendix I). In LKM-S compassion and wishes for well-being are directed toward self and others to promote self-compassion (Salzberg, 1995). The LKM-S was developed by Kirschner et al. (2019) in collaboration with an experienced mindfulness teacher who narrated the script. The LKM-S was 11.31 minutes long and started with directing loving/friendly feelings towards a close person (1-6 minutes) and then directing the same feelings towards oneself (minutes 7-11).

Neutral Emotion Induction (NEU) was designed by Kirschner et al. (2019) and narrated by the same mindfulness teacher to control for the effects of the audio meditation and to keep participants attention but not to develop any particular state. It is 11.37 minutes long, used the same number of words and describes walking around a supermarket (see Appendix J).
The Montreal Imaging Stress Task (MIST; Dedovic et al., 2005) is a laboratory-based stressor and was used as a PST to induce psychosocial evaluative stress (see Appendix K). It includes a series of mental arithmetic tasks shown on a computer screen. Participants engaged in a practice run with no time limit or negative feedback followed by two 3 minute stress-inducing runs with negative feedback in between runs. MIST leads to robust increases in physiological and subjective stress measures (Martens, Tunbridge, & Harrison, 2017).

**Apparatus.** E-prime 2 software (Psychology Software Tools; Sharpsburg, PA) was used to run the audio recordings and to collect self-report data on a standard PC. The responses were recorded using a mouse and a keyboard.

**Physiological measures.** Electrocardiogram (ECG) and SCL were recorded throughout the experiment. SCL and HR were used as markers of sympathetic arousal (Grassi et al., 1998; Jung et al., 2000; Sugenoya, Iwase, Mano, & Ogawa, 1990) and HRV as a measure of parasympathetic activity (Thayer & Lane, 2000). The specialised analysis programme for ECG data, AcqKnowledge 4.2 software (BIOPAC Systems; Goleta, CA) was used to filter and correct the data as well as remove the artefacts.

To obtain HR and HRV the ECG was recorded continuously from ECG electrode sensors placed underneath the left side of participant’s ribcage and below the participant’s right collarbone. The recordings were taken using a BIOPAC ECG100C amplifier at a sampling rate of 1 kHz with a low pass filter of 35 Hz and a high pass filter of 0.5 Hz. The procedures described by Berntson et al. (1997) were used where a two minute baseline was recorded as a comparison and a mean HR
and HRV was calculated for each minute of every time period (baseline, audio recordings, MIST) and then averaged for the overall total.

BIOPAC GSR100C amplifier and a skin resistant transducer (TSD203) were used to measure SCL. The recording was taken using bipolar Ag/AgCl reusable strap electrodes from participant’s non-dominant hand’ middle phalanx of the ring and first finger at a sampling rate of 500 Hz with a low pass filter of 1.0 Hz. Mean SCL per minute was calculated for each minute of the experimental procedure and then averaged for the time periods: baseline, audio recording and MIST.

Procedure

Participants were screened for the exclusion criteria (PHQ-8, GAD-7, screening questionnaire) and completed the trait measure questionnaires (SCS, GASP, FSCRS) online. Eligible participants were invited to an experimental session, received an information sheet and signed the consent form. The laboratory temperature was set for 21°C (to ensure accurate recording of SCL) and had sound-proof walls. Participants were fitted with the recording equipment, a BIOPAC™ MP150 system connected to a computer running the software AcqKnowledge 4.2 (BIOPAC Systems; Goleta, CA) and the psychophysiological variables (HR, HRV and SCL) were recorded during the whole procedure. State measures were recorded after baseline, an audio recording and MIST (see Figure 3). In the recovery period participants were asked to recall positive experiences (see Appendix L).
Figure 3. Experimental procedure

Data analysis

Data were analysed using statistical software SPSS version 25 (SPSS Inc, Chicago, Illinois). The data were explored using the Shapiro-Wilk test of normality and by visual inspection. Outliers were defined as values more than three SD’s away from mean (= standardized score > 3.29) (Tabachnick & Fidell, 2001). To retain the number of participants, outliers were not removed from the data but winsorised (i.e., Tukey’s hinges: Tukey, 1977; Tabachnick & Fidell, 2001) meaning that the outliers
were transformed and the extreme values were replaced with the next extreme data point plus one unit (Tabachnik & Fidell, 2001).

Mixed Analysis of variance (ANOVA) with time (pre-post) as within subject factor and group (LKM-S vs NEU) as between subject factor were used for analysis of variables, which met the parametric assumptions. Where parametric assumptions were violated nonparametric tests Mann Whitney U and Wilcoxon Signed-ranks tests were used.

**Manipulation checks for LKM-S.** 2 x 2 between measures ANOVA was used to investigate whether LKM-S induced self-compassion. The within-subjects factor was time (baseline, post audio recording) and the between-subjects factor was group (LKM-S and NEU).

**Manipulation checks for MIST.** 2 x 2 repeated measures ANOVA was used to check whether MIST effectively induced self-reported ESS distress. The within-subjects factor was time (post audio recording, post MIST) and the between-subjects factor was group (LKM-S and NEU).

**Hypothesis 1a, 1b and 2 statistics.** Differences in self-report measures of state shame, self-criticism and self-compassion pre and post MIST were investigated using ANOVAs for variables that met parametric test assumptions and Wilcoxon Signed-ranks and Mann-Whitney U for variables that violated parametric assumptions. The within-subjects factor was time (post audio recording, post MIST) and the between-subjects factor was group (LKM-S and NEU).

**Secondary hypothesis 3a and 3b.** Differences in physiological responses between LKM-S and NEU groups during the MIST were investigated by conducting a
series of independent sample t-tests or non-parametric equivalent, the Mann Whitney U for HRV, SCL, and HR data. The within-subjects factor was time (audio recording, MIST) and the between-subjects factor was group (LKM-S and NEU). The average change was calculated in HRV, SCL, and HR between the baseline and MIST conditions (post MIST data), and average change in HRV, SCL, and HR between the audio recording and MIST.

**Results**

Descriptive statistics were used for trait measures, demographic variables, and baseline measures of state affect (see Appendix M). Despite random allocation, we found significant group differences in gender, PHQ-8, GAD-7, self-criticism and SCS self-kindness.

**Manipulation Check for Engagement with the Tasks**

For the audio recordings participants reported that they could follow the task and paid attention to around 75% and more indicating good compliance. For MIST, participants reported high levels of attention paid but only around 50% following the instructions. Mann Whitney U tests showed that there was no significant difference between groups in participants’ attention and following the instructions during the audio meditation and MIST (see Table 1).
Table 1

Manipulation Responses (VAS scores)

<table>
<thead>
<tr>
<th>Group</th>
<th>Min-Max</th>
<th>M</th>
<th>Mdn</th>
<th>SD</th>
<th>Df</th>
<th>U</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Following the instructions in audio recording</td>
<td>NEU</td>
<td>7–100</td>
<td>75.30</td>
<td>82.50</td>
<td>27.57</td>
<td>60</td>
<td>477.00</td>
</tr>
<tr>
<td></td>
<td>LKM-S</td>
<td>26-100</td>
<td>79.50</td>
<td>85.50</td>
<td>21.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attention to audio recording</td>
<td>NEU</td>
<td>11-100</td>
<td>74.33</td>
<td>76.00</td>
<td>25.13</td>
<td>60</td>
<td>401.00</td>
</tr>
<tr>
<td></td>
<td>LKM-S</td>
<td>41-100</td>
<td>84.16</td>
<td>89.50</td>
<td>15.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Following the instructions in MIST</td>
<td>NEU</td>
<td>9-100</td>
<td>56.50</td>
<td>58.50</td>
<td>25.94</td>
<td>60</td>
<td>400.50</td>
</tr>
<tr>
<td></td>
<td>LKM-S</td>
<td>0-100</td>
<td>48.66</td>
<td>38.50</td>
<td>31.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attention to MIST</td>
<td>NEU</td>
<td>41-100</td>
<td>86.17</td>
<td>96.50</td>
<td>19.09</td>
<td>60</td>
<td>460.50</td>
</tr>
<tr>
<td></td>
<td>LKM-S</td>
<td>29-100</td>
<td>87.75</td>
<td>94.00</td>
<td>16.55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Manipulation Checks Pre and Post Audio Recording

VAS SC composite. There was a significant increase in self-compassion between baseline and post audio recordings (Z = -2.08, p = .037, r =.26) across the whole sample (see Table 2). This effect was qualified by a significant pre to post audio recording increase in the SC composite in LKM-S group (Z = -2.684, p = .007, r = .034) whereas there was no significant increase in self-compassion over time for the NEU (Z = -.091, p = .927, r = 0.01). Additionally, post audio recording, there was significantly higher self-compassion in the LKM-S group as compared to the NEU (U = 336.00, p = .042, r = .26), whereas at baseline there was no significant difference between induction conditions (U=476.50, p = .961, r =.01). This indicates that, as expected, LKM-S significantly increased self-compassion whereas no significant effect on self-compassion was found in the NEU.
Table 2.

*Pre to Post Audio Recording Self-report Measures*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Group</th>
<th>Pre audio recording</th>
<th>Post audio recording</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>Mdn</td>
</tr>
<tr>
<td>VAS Self-Compassion</td>
<td>NEU</td>
<td>70.83</td>
<td>73.50</td>
</tr>
<tr>
<td></td>
<td>LKM-S</td>
<td>70.63</td>
<td>74.00</td>
</tr>
<tr>
<td>VAS Self-criticism</td>
<td>NEU</td>
<td>39.70</td>
<td>43.50</td>
</tr>
<tr>
<td></td>
<td>LKM-S</td>
<td>53.53</td>
<td>60.00</td>
</tr>
<tr>
<td>ESS</td>
<td>NEU</td>
<td>30.63</td>
<td>30.50</td>
</tr>
<tr>
<td></td>
<td>LKM-S</td>
<td>31.47</td>
<td>31.50</td>
</tr>
</tbody>
</table>

*Manipulation Check Pre and Post MIST*

**ESS distress.** (see Table 3). There was a significant increase in ESS distress pre to post MIST ($Z = -6.12$, $p < .001$, $r = .77$), across the whole sample but no significant differences between induction conditions pre MIST ($U = 401.50$, $p = .246$, $r = .15$) and post MIST ($U = 454.00$, $p = .709$, $r = .05$). Additionally, there was a significant increase in ESS distress pre and post MIST in both the NEU group ($Z = -4.048$, $p < .001$, $r = .51$) and the LKM-S group ($Z = -4.656$, $p < .001$, $r = .59$). This indicates that MIST was effective in increasing participants' distress regardless of the group membership suggesting MIST was a successful psychosocial stressor.
Table 3

*Pre to Post MIST Self-Reported Measures*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Group</th>
<th>Pre MIST</th>
<th></th>
<th>Post MIST</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>Mdn</td>
<td>M</td>
</tr>
<tr>
<td>ESS distress</td>
<td>NEU</td>
<td>2.27</td>
<td>1.17</td>
<td>2.00</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td>LKM-S</td>
<td>1.94</td>
<td>1.08</td>
<td>2.00</td>
<td>4.19</td>
</tr>
<tr>
<td>ESS</td>
<td>NEU</td>
<td>29.20</td>
<td>5.07</td>
<td>29.00</td>
<td>42.40</td>
</tr>
<tr>
<td></td>
<td>LKM-S</td>
<td>27.47</td>
<td>4.95</td>
<td>26.50</td>
<td>43.47</td>
</tr>
<tr>
<td>Self-Criticism</td>
<td>NEU</td>
<td>32.83</td>
<td>25.69</td>
<td>27.50</td>
<td>63.57</td>
</tr>
<tr>
<td></td>
<td>LKM-S</td>
<td>24.72</td>
<td>28.43</td>
<td>9.50</td>
<td>71.59</td>
</tr>
<tr>
<td>SC composite</td>
<td>NEU</td>
<td>71.57</td>
<td>17.89</td>
<td>73.00</td>
<td>53.57</td>
</tr>
<tr>
<td></td>
<td>LKM</td>
<td>81.00</td>
<td>16.68</td>
<td>85.50</td>
<td>54.34</td>
</tr>
</tbody>
</table>

**Hypothesis Testing**

**Hypothesis 1.** Hypothesis 1 investigated if LKM-S had a shame and self-criticism reducing effect as measured by self-reports post audio recording and post MIST.

*ESS baseline to post audio recording.* (See Table 2). A mixed ANOVA revealed a significant main effect of time $F(1, 60) = 9.18$, $p = 0.004$, $\eta^2 = 0.133$, but no significant effect of group $F(1, 60) = .179$, $p = .673$, $\eta^2 = .003$ or group by time interaction $F(1,60) = 2.047$, $p = .158$, $\eta^2 = .033$. This suggests that receiving an LKM-S did not reduce shame significantly better than NEU post audio recording and thus did not support hypothesis 1a.

*ESS pre and post MIST.* State levels of shame pre and post MIST are shown in Table 3. A mixed ANOVA revealed a significant main effect of time $F(1, 60) = 164.588$, $p < .001$, $\eta^2 = .733$, but no significant effect of group $F(1, 60) = .062$, $p = .805$, $\eta^2 = .001$ or group by time interaction $F(1,60) = 1.513$, $p = .223$, $\eta^2 = .025$. 
This indicates that receiving an LKM-S did not reduce shame significantly better than NEU post MIST therefore, hypothesis 1a was not supported.

**VAS self-critical baseline to post audio recording.** (See Table 2). There was a significant decrease in self-criticism pre to post audio recording \((Z = -3.313, p = .001, r = .42)\), across the whole sample. This was qualified by a significant decrease in self-criticism in the LKM-S group \((Z = -3.179, p = .001, r = .40)\), whereas there was no significant decrease in self-criticism over time in the NEU \((Z = -1.440, p = .150, r = .18)\). Interestingly, there were significant differences between groups pre audio recording \((U = 330.50, p = .035, r = .27)\) but not post audio recordings \((U = 358.00, p = .085, r = .22)\). Although groups did not differ significantly in state self-criticism post audio recording, as hypothesised the LKM-S showed significant reductions in self-criticism.

**VAS self-critical pre and post MIST.** (See Table 3). There was a significant increase in self-criticism pre and post MIST \((Z = -6.58, p < .001, r = .83)\), across the whole sample but no significant differences between induction conditions pre MIST \((U = 358.00, p = .085, r = .22)\) and post MIST \((U = 398.00, p = .248, r = .15)\). Additionally, there was a significant increase in self-criticism pre and post MIST in the NEU group \((Z = -4.509, p < .001, r = .57)\) and the LKM-S group \((Z = -4.834, p < .001, r = .61)\). This indicates that LKM-S did not reduce self-criticism post MIST significantly better than NEU and therefore hypothesis 1b was not supported.

**Hypotheses 2.** Hypothesis 2 investigated if LKM-S had a protective effect as indicated by levels of self-reported self-compassion post MIST.
**VAS SC composite baseline to post audio recording.** The self-compassion manipulation check showed that, as hypothesised, the levels of self-compassion were significantly higher in LKM-S than NEU post audio recording.

**VAS SC composite pre and post MIST.** (see Table 3). There was a significant decrease in self-compassion pre to post MIST ($Z = -5.991$, $p < .001$, $r = .75$), across the whole sample and significant differences in self-compassion levels between induction conditions pre MIST ($U = 336.00$, $p = .042$, $r = .26$) but not post MIST ($U = 469.00$, $p = .877$, $r = .02$). Additionally, there was a significant decrease in self-compassion pre and post MIST in the NEU group ($Z = -4.001$, $p < .001$, $r = .51$) and the LKM-S group ($Z = -4.451$, $p < .001$, $r = .56$). The absence of a significant group difference post MIST and that both groups show a significant and comparable reduction of self-compassion from pre to post MIST indicates that hypothesis 2 was not supported.

**Hypothesis 3.** Hypothesis 3 investigated if LKM-S had a stress reducing effect as measured by physiological response to MIST. The mean scores for physiological variables can be seen in Table 4.

**HR.** There were no significant differences in HR response between groups $t(60) = -.49$, $p = .625$, $r = .01$ while listening to the audio recordings and no significant group differences in HR response while engaging in MIST $t(60) = -.48$, $p = .634$, $r = .12$. This means that hypothesis 3a was not confirmed.

**SCL.** There were no significant differences in SCL response between groups while listening to the audio recording ($U = 445.00$, $p = .622$, $r = .06$) however there was a significant difference between groups in SCL response to MIST ($U = 315$, $p = .02$)
.020, \( r = .29 \) with the LKM-S group showing higher SCL response than the NEU group (see Table 4). This means that hypothesis 3a was not confirmed.

**HRV.** There were no significant differences in HRV response between groups while listening to the audio recordings \((U = 445.00, p = .622, r = .06)\) and no significant differences between groups while engaging in MIST \((U = 443.00, p = .602, r = .07)\). This means that hypothesis 3b was not supported.

### Table 4

**Mean Scores for Physiological Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>NEU M(SD)</th>
<th>NEU Mdn</th>
<th>LKM-S M (SD)</th>
<th>LKM-S Mdn</th>
<th>NEU MIST M (SD)</th>
<th>NEU MIST Mdn</th>
<th>LKM-S MIST</th>
<th>LKM-S MIST Mdn</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR response change* (BPM)</td>
<td>-.17 (2.92)</td>
<td>-.35</td>
<td>.21 (3.25)</td>
<td>.90</td>
<td>5.64 (6.99)</td>
<td>4.88</td>
<td>6.66 (9.52)</td>
<td>4.90</td>
</tr>
<tr>
<td>SCL response change* (µS)</td>
<td>-.05 (.16)</td>
<td>-.08</td>
<td>-.04 (.21)</td>
<td>-.02</td>
<td>.24 (.17)</td>
<td>.25</td>
<td>.34 (.16)</td>
<td>.33</td>
</tr>
<tr>
<td>HRV response change* (ms²/Hz)</td>
<td>-.08 (.39)</td>
<td>-.08</td>
<td>-.07 (.60)</td>
<td>-.03</td>
<td>-.28 (.78)</td>
<td>-.22</td>
<td>-.36 (.85)</td>
<td>-.32</td>
</tr>
</tbody>
</table>

**Note.** MIST = Montreal Imaging Stress Task; LKM-S = Loving Kindness Meditation for Self; NEU = Neutral Emotion Induction; HRV = Heart Rate Variability; SCL = Skin Conductance Level; HR = Heart Rate; ms = milliseconds; * = relative to baselines prior to MIST or audio recording respectively; BPM = Beats per Minute; µS = microSiemens; ms²/Hz = milliseconds (squared)/hertz.

**Discussion**

This study investigated whether a Loving Kindness Meditation (LKM-S), that activates a state of self-compassion, has a protective effect in terms of reducing state shame and self-criticism when exposed to a Psychosocial Stress Test (PST) as compared to neutral group, NEU. It was hypothesized that participants receiving LKM-S would have lower scores on state shame and self-criticism post MIST. The study also investigated whether LKM-S’ self-compassion inducing effect would be demonstrated in participants’ response to PST as shown by higher self-compassion levels post MIST in LKM-S as compared to NEU. Additionally, the research used
markers of sympathetic and parasympathetic activation to investigate whether LKM-S attenuated physiological responses to the PST. Although the LKM-S increased self-reported self-compassion, none of the described hypotheses were confirmed and the findings are critically evaluated below.

The current research did not find the hypothesized shame and self-criticism reducing effects of LKM-S when exposed to psychosocial stress, despite previous research suggesting that self-compassion has stress and shame reducing effects. Ewert et al. (2018) employed an experimental design to investigate the effects of trait self-compassion on shame and perceived stress, as measured by self-report, in reaction to PST whereas my study assessed experimentally induced self-compassion. The study found higher trait self-compassion predicted less shame and perceived stress immediately after the stressor. However, their study differed from mine as they used a measure of negative affect, consisting of a single shame item asking participants how ashamed they felt (Crawford & Henry, 2004) whereas my study used a validated measure of shame (ESS; Turner, 2014) that does not name shame explicitly thereby reducing avoidance to report feelings of shame. To regulate feelings of shame people may suppress awareness and/or deny the experience of it (Nathanson, 1992) which may have lead to underreporting of feelings of shame in Ewert et al.’s (2018) study.

Moreover, despite using randomization, the LKM-S group had significantly higher baseline levels of self-criticism. This could have affected how well individuals in the LKM-S condition could increase or maintain a self-compassionate state. Self-critical individuals may find it difficult to develop self-compassion and need more practice to benefit from a self-compassion tempering effect on self-criticism (Gilbert,
Although the LKM-S was successful in increasing self-reported self-compassion, the effect was perhaps too transient for a satisfactory carry over effect to manage a socially stressful situation. Therefore, the effect may have been too small to address people’s habitual and negative responses to threat, so under threat they reverted back to their default emotion regulation strategies. In addition, providing further support for the detrimental role of self-criticism for activating self-compassionate states, my physiological results show that in the LKM-S group I could not replicate Kirschner et al.’s (2019) findings of a concurrently reduced physiological arousal and increased parasympathetic activation. Such a discrepancy between self-report and physiological response to LKM-S has previously been found in currently remitted individuals with a history of recurrent depression (Kirschner et al., 2020); specifically, individuals known to have high levels of self-criticism.

My findings and those of previous research, taken together, may suggest that a one-off self-compassion exercise is not sufficient and a longer self-compassion intervention, where compassion skills can be learned over time and repeatedly practised (Wilson, Mackintosh, Power, & Chan, 2019), is more effective because it increases dispositional rather than just state self-compassion making it more accessible when individuals are under threat. Shahar et al. (2015) showed that eight weeks LKM practice resulted in a significant increase in trait self-compassion and reduction in trait self-criticism; however, the authors did not measure the effect of the intervention when individuals were under threat.

Alternatively, other techniques could be more effective than LKM-S (mainly involving repeating soothing statements), in attenuating threat responses, such as compassion-focused imagery, which includes visualizing people or oneself directing
compassion towards ourselves (Gilbert, 2010). Mental imagery helps alter stored perceptual information (Pearson, Naselaris, Holmes, & Kosslyn, 2015), can involve several sensory modalities and evokes strong emotional states (Holmes & Mathews, 2010). Mental imagery also activates the same neural regions as perception in the equivalent sensory modality (Kosslyn, Ganis, & Thompson, 2001). In Naismith, Duran-Ferro, Ingram, and Jimenez-Leal's (2019) research, participants recalled a shameful memory and rated their shame levels. Subsequently they engaged in a one off compassionate imagery exercise where they created an image of a compassionate ideal using multiple modalities (e.g., visual, auditory, touch). Participants then recalled the same shame-inducing memory but considered the perspective of the compassionate ideal and again rated their shame levels.

Naismith et al. (2019) showed participants’ shame significantly decreased post compassionate imagery and individuals with higher levels of state shame before the imagery had greater reductions in shame. Therefore, using imagery with multisensory components and developing bespoke image may be more powerful in reducing shame than using meditation with only auditory and visual components and a set script.

Another explanation for the lack of significant differences between groups in self-criticism and shame post PST with more females in LKM-S than NEU. Research shows females have lower levels of self-compassion than males (Yarnell et al., 2015) and report higher levels of subjective stress on PST (Lee et al., 2014). Furthermore, MIST is an arithmetic task and women consistently report significantly higher levels of math anxiety than men (Ferguson, Maloney, Fugelsang & Risko, 2015). Therefore, it may be that the lack of a protective effect of self-compassion on
self-criticism and shame was due to gender differences resulting in higher levels of stress and negative evaluation in the LKM-S group. However, the baseline measures also showed higher anxiety and depression levels in the NEU group and higher dispositional self-kindness in the LKM-S group.

To account for the possible confounder, such as gender differences, all analyses were rerun in the female only sample, which demonstrated there was no longer a significant difference in baseline measures for self-kindness, anxiety and depression levels. However, as in the entire sample, statistical analysis for hypothesis 1 and 2 in females only \(N = 48\) revealed there were similar results for self-compassion, state shame and self-criticism pre to post PST. This indicates that differences in baseline anxiety, depression and self-kindness can be explained by gender differences. However, the significant difference between the groups in baseline self-criticism remained with LKM-S having higher self-criticism than NEU. Therefore, the preexisting differences between groups may have diminished self-compassion effect on PST.

The hypothesis that self-compassion levels will be higher for LKM-S group post PST as compared to NEU were not confirmed although, as in the Kirschner et al.’s (2019) research, the LKM-S group reported higher self-compassion after the meditation. The lack of effect on PST is surprising as research shows LKM activates the soothing system’s function and increases levels of self-compassion (Smeets et al., 2014) helping individuals feel safe and alleviate feelings of threat (Gilbert, 2009) and appraising stressors as less threatening (Terry & Leary, 2011). In Arch et al.’s (2014) study self-compassion training reduced psychobiological responses to psychosocial stress, compared to controls, as measured by self-reports of anxiety
and parasympathetic activation. Another study showed trait self-compassion was negatively related to the degree of sympathetic nervous response to PST (Breines et al., 2015). In line with this, it was expected participants would be compassionate to themselves when experiencing failure in PST.

The loss of the group effect of self-compassion during the stress response may again be explained by the baseline group differences showing that LKM-S had higher self-criticism levels and more females, suggesting there may have been group differences due to the stress perception (Lee et al., 2014) and the ability to access and maintain self-compassionate emotion regulation (Yarnell et al., 2015).

The hypothesis that LKM-S will attenuate physiological responses to PST were not confirmed. This is not in line with Arch et al.’s (2014) research showing that LKM diminishes psychophysiological markers of stress (dampened sympathetic nervous system reactivity and more adaptive parasympathetic HRV) in response to PST. However, the participants practiced LKM over four sessions. In contrast, Pace et al. (2009) showed that, compared to controls, six weeks of training in compassion to self and others meditation did not reduce stress response, as measured by cortisol levels, when participants were exposed to PST. Nevertheless, the authors found that increased practice of the meditation was correlated with less self-reported distress. This indicates that more LKM practice may be required to diminish psychophysiological responses to stress.

Interestingly, whereas there were significant differences between groups in self-reported self-compassion post audio recordings, there were no physiological differences between groups while listening to the audio recordings. Those discrepancies between psychological and physiological responses may mean the
LKM-S worked in the current study at strategic level (top down), which was not sufficient to change the underlying negative responses to threat and self (Kirschner, Kuyken, & Karl, 2020). Kirschner et al. (2020) proposed that self-reports are representative of strategic responses whereas physiological responses are markers of more automatic and habitual reactions (bottom up). Again, the higher levels of baseline self-criticism in LKM-S could have made compassionate self less accessible under threat.

Kirschner et al. (2020) showed that participation in MBCT (including a self-compassion component) modified psychophysiological responses to LKM-S, as compared to controls, which were attributed to changes in negative self-bias. Participants from the MBCT group, as opposed to untreated controls, post MBCT showed enhanced parasympathetic activity (measured by HRV), reduced physiological arousal (measured by HR) and significantly increased levels of self-compassion state and trait. This suggests, while self-compassion state can be effectively induced by LKM-S, underlying habitual responses may not be effectively reduced, especially under threat, by a single session of LKM-S, and more in depth intervention is needed to address the negative habitual responses.

**Theoretical and Clinical Implications**

Consistent with Gilbert’s (2009) tripartite model this study showed that a brief compassion exercise can activate the soothing system by inducing a self-compassion state. However, the temporary and partial activation of the soothing system found in this study did not downregulate the threat system as proposed by Gilbert (2009) thus demonstrating that a single session of LKM-S is insufficient to
protect against a threat response (e.g., shame and self-criticism) as it induces only a transient self-compassion state.

Additionally, the discrepancy between self-report and physiological response to LKM-S, previously found in individuals with high self-criticism (Kirschner et al., 2020), highlights individual differences in self-criticism should be taken into account in clinical assessments and formulation when considering compassion-based approaches. This is because one-off self-compassion practice is likely to provoke only temporary changes at strategic, rather than a more habitual and automatic level (Kirschner et al., 2020), and is not enough to develop a soothing system that can downregulate the threat system (Gilbert, 2014) meaning that a compassionate attitude would not be accessible and maintained for self-critical individuals under threat.

The aforementioned suggests brief self-compassion training is insufficient to produce a beneficial effect on emotion regulation, as shown in literature (MacBeth & Gumley, 2012), and a longer CFI is required, allowing compassion skills to be learned and practised (Wilson et al., 2019). Regular practice may be more effective as it increases dispositional, rather than just state self-compassion, making it more accessible when individuals are under threat. It is important therefore, clinicians are consistent with using self-compassion techniques, to help clients cultivate self-compassion regularly, otherwise when used infrequently, they may be ineffective for individuals with a negative self-view.
Limitations and Future Research

This study has a number of limitations. Firstly, the randomization was not successful resulting in significant differences between groups in baseline measures relevant for this research (e.g., self-criticism). Future research could control for those variables by using stratified randomization; i.e., balancing among groups in terms of participants’ baseline characteristics (covariates) (Suresh, 2011).

Another limitation of this study is mainly the student and university staff sample, which may not be generalizable to a general population and mental health patients. Further research could investigate the effect of self-compassion on shame in a clinical population using longer intervention and compassionate imagery.

In terms of strengths, this is one of the few studies using an experimental rather than survey design in this research field. It used experimental manipulations widely used in research and known to induce the desired affects (Martens et al., 2017; Kirschner et al., 2019). The study also assessed psychophysiological variables to complement self-report measures, an approach proposed to triangulate mechanism in clinical psychology research (Holmes, Craske, & Graybiel, 2014).

In terms of methodological strengths, the manipulations were successful in inducing the expected affect in participants. Therefore, conclusions could be drawn on the direct impact of state self-compassion on state shame and self-criticism. Additionally, participants were randomly assigned to groups, minimizing the researcher bias, and above the sufficient number of participants required for statistical power was recruited.
Regarding contribution to knowledge, researching shame and self-criticism has important clinical implications as shame is associated with mental health difficulties (Duarte & Ferreira, 2016) and this study is the first to measure the direct psychophysiological effects of self-compassion on shame and self-criticism.

**Conclusions**

This research investigated the efficacy of LKM-S to reduce psychophysiological responses to PST as measured by self-criticism, shame and markers of sympathetic and parasympathetic activation. There were no significant differences between the groups in response to PST as measured by self-compassion, self-criticism, state shame and physiological variables. The findings may be affected by the baseline differences in gender and self-criticism as well as the length and content of the compassion-focused intervention used. Further research is recommended with a clinical population using a different self-compassion exercise and a longer compassion-focused intervention.
References


depressed individuals. *Mindfulness, 1*, 21–27. doi: 10.1007/s12671-010-0004-7


Lawrence, V., & Lee, D. (2013). An exploration of people's experiences of compassion-focused therapy for trauma, using interpretative


Appendices

Appendix A: Ethics Approval

Re: Aleksandra Laszczynska e-Ethics Application outcome decided (eCLESPsy000775 v3.1)

---

Dear Aleksandra Laszczynska,

Application ID: eCLESPsy000775 v5.1

Title: Immediate psychophysiological effects of induced self-compassion state on experience of shame following a social evaluative task.

Your e-Ethics application has been reviewed by the CLES Psychology Ethics Committee. The outcome of the decision is: **Favourable**

**Potential Outcomes**

| Favourable: | The application has been granted ethical approval by the Committee. The application will be flagged as Closed in the system. To view it again, please select the tick box: View completed |
| Favourable, with conditions: | The application has been granted ethical approval by the Committee **conditional** on certain conditions being met, as detailed below. Unless stated otherwise, **please resubmit the requested amendments** via the online system before beginning the research. |

---

From: Moberly, Nick
Sent: 01 April 2019 17:10:42
To: Laszczynska, Aleksandra
Cc: Karl, Anie
Subject: RE: Aleksandra Laszczynska e-Ethics Application outcome decided (eCLESPsy000775 v3.1)

Aleks,

Yes you can go ahead on condition that you remove ‘recently’ from those instructions.

Can you see your application on the online system if you tick ‘view completed’? If not, then I am unable to give you a copy of the application – you should ask ethics@rue.ac.uk

Good luck,
Nick
<table>
<thead>
<tr>
<th><strong>Provisional:</strong></th>
<th>You have <strong>not</strong> been granted ethical approval. The application needs to be amended in light of the Committee's comments and re-submitted for Ethical review.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unfavourable:</strong></td>
<td>You have <strong>not</strong> been granted ethical approval. The application has been <strong>rejected</strong> by the Committee. The application needs to be amended in light of the Committee's comments and resubmitted / or you need to complete a new application.</td>
</tr>
</tbody>
</table>

Please view your application [here](#) and respond to comments as required. You can download your outcome letter by clicking on the 'PDF' button on your eEthics Dashboard.

If you have any queries please contact the CLES Psychology Ethics Chair:

**Nick Moberly** n.j.moberly@exeter.ac.uk

Kind regards,

CLES Psychology Ethics
Appendix B: Participant Information Sheet

PARTICIPANT INFORMATION SHEET

Title: Effect of stress on emotional processing.

Principal Researcher: Aleksandra Laszczynska
Supervisors: Dr Anke Karl and Dr Nick Moberly.

You are being invited to take part in a study which aims to investigate the relationship between emotional processing, stress and biological reactions. Before you decide whether you would like to take part, please read through the following information which will clarify why the study is being conducted, and what your involvement would be.

What is the purpose of the study?
The aim of this study is to examine the relationship between stress, emotional processing, and biological responses. The findings could hopefully help us to understand how people cope with stress and what may help them in stressful situations. The study will form the basis of a Doctorate of Clinical Psychology thesis being undertaken by the Principal Researcher (Aleksandra Laszczynska, see contact details below, page 2).

Am I required to take part?
It is entirely up to you if you wish to take part. If you do decide to take part, you are free to change your mind at any time and can withdraw during the study by letting the Principle Researcher know. If you decide not to take part after you have started the study, any data collected will no longer be included in the results of the study and will instead be destroyed.

What does participation involve?
If you think that you would like to take part in the study, the Principal Researcher can contact you by telephone or email to discuss the study in more detail, and to answer any questions you may have. Alternatively, you can contact the Principle Researcher – see page 2).

In order to take part in this study you will be asked to complete a screening questionnaire that will be sent to you by email. If you are currently experiencing excessive levels of distress in your daily life, have mental health difficulties or if you have a history of psychological trauma or posttraumatic stress disorder we advise you not to participate in this research. Individuals who fulfill the inclusion criteria will then be invited to participate in a laboratory session which lasts approximately 1 hour and includes several tasks during which we will measure your heart rate and the sweat response. For this, we will clean your skin with alcohol and place leads on your chest and fingers which we fill with a salty gel that can be easily wiped off. After we have PST this up you will asked to complete a number of different computer tasks, some of them you may perceive as challenging or temporarily stressful, some of them you may find interesting or somewhat boring. The precise instructions will be given on the day.

Expenses and payments:
If you are a Psychology student at the University of Exeter, you will be awarded 1.5 course credits or you can be paid £5 pounds for your participation. You will also be entered into a draw to win £50 of Amazon vouchers. If you are not eligible to take part in the laboratory session you can claim 0.5 credits for filling out the screening questionnaire.

Are there disadvantages of taking part in this study?
There are no known disadvantages associated with taking part in the study. The measurement of bodily responses will be done using safe and well-established procedures; the leads can be removed in less than a minute and the gel can be easily wiped and/or washed off. Some of the computer tasks may be
challenging and can temporarily lead to mild to moderate distress usually lasting no longer than a few minutes. In the unlikely event that you experience the tasks as extremely unpleasant we will stop the testing. You may enjoy some of the tasks you may find others boring. All experimental and physiological recording procedures have been safely and widely used in research.

What if there is a problem?
If you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this study, you can contact the Study Supervisor, Dr Anke Karl (contact details on page 3).

What are the possible advantages of taking part?
There are no direct advantages for you. However, the findings of this study will help us to understand how stress, emotional processing, and body responses are related. This may help us understand how individuals cope with stress and how we can facilitate wellbeing. If you decide to take part, we hope that you will find the experience interesting and enjoyable.

Will my taking part in the study be kept confidential?
All information which is collected from you during the research would be kept strictly confidential within the limits of the law. You will be allocated your own unique study code number, ensuring that all information that you give will contain your number rather than your actual name. Identifiable information will be stored in a locked cabinet and only the researchers of this project will have access to it. In accordance with British Psychological Society research guidelines, all data for the study will be securely stored for 20 years and will be destroyed after this time.

What will happen with the results?
It is planned that the results will be written up in order to inform clinicians and researchers who are interested in mood disorders. Any write-up of the findings for this study will not mention you personally. If you would like to obtain a copy of the findings, we will be more than happy to send them to you when they become available.

Who has reviewed this study?
This study has been reviewed and approved by the School of Psychology Ethics Committee, University of Exeter.

Contact details
If you require further information or would like to ask any questions, please do not hesitate to contact the Principal Researcher using the details below.

Principal Researcher:
Aleksandra Laszczynska
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Appendix C: Participant Consent Form

PARTICIPANT CONSENT FORM

Title: Effect of stress on emotional processing.

Researcher:  Supervisors:
Aleksandra Laszcynska  Dr Anke Karl & Dr Nick Moberly
Clinical Psychology Doctoral Program  Mood Disorders Centre
Washington Singer Laboratories  Washington Singer Laboratories
Perry Road  Perry Road
Exeter  Exeter
EX4 4QG  EX4 4QG
al635@exeter.ac.uk  A.Karl@exeter.ac.uk

Please read statement and initial box

1) I confirm that I have read and understood the Information Sheet for the above study. I have had the opportunity to consider the information and ask questions, and have had these answered satisfactorily.

2) I am aware that my participation is voluntary and that I can withdraw my consent at any point during the study without giving any reason, and without my legal rights or medical care being affected.

3) I understand that I have the right to obtain information about the findings of the study after it is completed.

4) I understand that sections of the data collected during the study may be looked at by relevant individuals of the University of Exeter (i.e. the research Supervisors) and from regulatory authorities, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my data.

5) I agree to take part in the above study.

6) I would like my name and contact details to be kept on a secure and confidential database so that I can be contacted about taking part in other research studies within the Mood Disorders Centre.

Name of participant (print)  Date:  Signature
Name of researcher (print)          Date:          Signature

One copy for participant, one copy for researcher
Appendix D: Participant Debriefing Sheet

DEBRIEFING FORM

Title: Effects of self-compassion on emotional processing.

Principal Researcher: Aleksandra Laszcynska
Supervisors: Dr Anke Karl, Dr Nick Moberly

Thank you for participating in this study – your time and effort is very much appreciated!

You have taken part in a study which investigates the psychological and physiological effects of self-compassion on socially stressful situations and experiences of shame.

“Self-compassion” involves being kind to ourselves and not judging ourselves when we experience misfortune and personal failings. It involves an acceptance that such experiences will occur and that it is okay for them to occur, and an acknowledgment that we are not alone in experiencing them.

Purpose of the study:
The current study aimed to investigate whether self-compassion could reduce the psychological and physiological effects of socially stressful experiences. The findings could help understand the beneficial effects of self-compassion and whether it can reduce feelings of shame in socially stressful situations. This important because excessive and chronic feelings of shame has been implicated in many mental health difficulties.

Negative experiences of social situations in which people feel judged (social evaluations) are thought to induce strong negative self-evaluations, self-critical thinking and feelings of shame. Indeed, evidence shows that negative social evaluations and rejections are amongst the most important factors contributing to feelings of shame.

The non-judgemental, kind and accepting attitude promoted by self-compassion may be an effective strategy to alleviate distress at times when we feel judged, or judge ourselves, in social situations. Research shows that people with high levels of self-compassion experience less psychological distress to negative life events. In addition, they show less physiological stress responses as measured by heart rate and skin conductance. Moreover, research studies have shown that training participants in self-compassion reduces their experience of distress in stressful social situations, suggesting that self-compassion can be protective in these contexts. However, the underlying mechanisms by which this is achieved remain unknown.

Findings from this study will help us to build up a better picture of how self-compassion works and it potential effects on experiences of shame. This is important since self-compassion is a
relatively new concept in psychology research and its psychological and physiological processes are not well understood.

**The social stress task:**
As part of the study you took part in the Montreal Imaging Stress Test (MIST) which has been designed to induce social stress in participants. One way the test achieves this is to provide false information about participants' performance – you were shown a graph and received feedback which suggested that you were performing badly in the test, and worse than other participants. This information was not accurate and was included to increase your stress response. In fact, your performance in the MIST task was not compared to any other participants' performance.

**Groups:**
You will have been allocated to either the “self-compassion” group who received the Loving Kindness Meditation, or the “neutral” group who received the Supermarket Induction. Due to the hypothesised benefits of self-compassion on social stress, if you were in the “neutral” group you will be asked if you would like to listen to the Loving Kindness Meditation before you leave.

**If you feel low or anxious:**
All the procedures used in the study have been shown to be safe and are widely used in research studies to induce temporary stress which usually fades within few minutes. However, in the unlikely event that you continue to feel distressed, anxious, or experience low mood, please inform the principal researcher and/or contact the University of Exeter wellbeing service, your G.P., or one of the following helplines:

- Samaritans: 116 123
- MIND: 0300 123 3393
- SANE: 0300 304 7000
- University of Exeter Wellbeing Service: 01392 724381

**Contact Details:**
If you have any further questions, or you would like your data to be removed from the study, please do not hesitate to contact either the Principal Researcher, or the chair of the University of Exeter Psychology Research Ethics Committee (REC) using the details below.

**Principal Researcher:**
Aleksandra Laszczynska
Doctorate in Clinical Psychology programme
Washington Singer Laboratories
Perry Road

**University of Exeter REC chair:**
Dr. Lisa Leaver
University of Exeter
Washington Singer Laboratories
Perry Road
Appendix E: Power Analysis and Determination of Sample Size

There is a lack of studies investigating the impact of self-compassion state on shame state however studies investigating self-compassion found large effect sizes for changes in self-reported self-compassion following LKM (Kirschner et al., 2019). This study however did not include PST and measures of shame and there is a lack of studies in this area. Therefore it was decided to calculate power for medium effect sizes. Sample size was determined following a-priori power calculation using G*Power (version 3.1.3; Faul, Erdfelder, Buchner & Lang, 2009). Analyses were calculated for 95% power with an alpha error rate of 0.05. For hypothesis one to investigate interactions effects using 2X2 ANOVA for self-reported state shame, self-criticism and distress, it was calculated that 54 participants is needed to detect medium effects ($\eta^2 = 0.25$). For hypothesis two to investigate interactions effects using 2X2 ANOVA for self-reported coping, it was calculated that 54 participants is needed to detect medium effects ($\eta^2 = 0.25$).

Table 5

Power Estimation for Each Hypothesis

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Measure/DV</th>
<th>Analysis</th>
<th>Effect size $f$</th>
<th>Alpha error rate</th>
<th>Power</th>
<th>Required sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1</td>
<td>Self-reported SS and self-criticism</td>
<td>2X2 ANOVA interaction effects</td>
<td>0.25</td>
<td>0.05</td>
<td>95%</td>
<td>54</td>
</tr>
<tr>
<td>Hypothesis 2</td>
<td>Self-reported SC</td>
<td>2X2 ANOVA interaction effects</td>
<td>0.25</td>
<td>0.05</td>
<td>95%</td>
<td>54</td>
</tr>
</tbody>
</table>

*Note: SS = State Shame*
**Appendix F: Screening Measures**

**PHQ-9 Depression**

Over the last 2 weeks, how often have you been bothered by any of the following problems?  
*(Use "✔️" to indicate your answer)*

<table>
<thead>
<tr>
<th>Problem</th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Little interest or pleasure in doing things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Feeling down, depressed, or hopeless</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Trouble falling or staying asleep, or sleeping too much</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Feeling tired or having little energy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Poor appetite or overeating</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. Trouble concentrating on things, such as reading the newspaper or watching television</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. Thoughts that you would be better off dead or of hurting yourself in some way</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Column totals:  

Column totals: ___ + ___ + ___ + ___  

= Total Score _____

From the Primary Care Evaluation of Mental Disorders Patient Health Questionnaire (PRIME-MD PHQ). The PHQ was developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues. For research information, contact Dr. Spitzer at rls8@columbia.edu. PRIME-MD® is a trademark of Pfizer Inc. Copyright© 1999 Pfizer Inc. All rights reserved. Reproduced with permission.
Generalized Anxiety Disorder Scale 7-Item Scale (GAD-7)

Generalized Anxiety Disorder 7-item (GAD-7) scale

<table>
<thead>
<tr>
<th>Over the last 2 weeks, how often have you been bothered by the following problems?</th>
<th>Not at all sure</th>
<th>Several days</th>
<th>Over half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feeling nervous, anxious, or on edge</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Not being able to stop or control worrying</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Worrying too much about different things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Trouble relaxing</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Being so restless that it's hard to sit still</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Becoming easily annoyed or irritable</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. Feeling afraid as if something awful might happen</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Add the score for each column

Total Score (add your column scores) =

If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all __________
Somewhat difficult __________
Very difficult __________
Extremely difficult __________

Appendix G: Trait Measures

The Self-compassion Scale

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

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

<table>
<thead>
<tr>
<th>Almost never</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Almost always</th>
</tr>
</thead>
</table>

1. I'm disapproving and judgmental 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 and out, 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.
15. I try to see my failings as part of the human condition.
16. When I see aspects of myself that I don't like, I get down on myself.
17. When I fail at something important to me I try to keep things in perspective.
18. When I’m really struggling, I tend to feel like other people must be having an easier
time of it.

19. I’m kind to myself when I’m experiencing suffering.

20. When something upsets me I get carried away with my feelings.

21. I can be a bit cold-hearted towards myself when I’m experiencing suffering.

22. When I’m feeling down I try to approach my feelings with curiosity and openness.

23. I’m tolerant of my own flaws and inadequacies.

24. When something painful happens I tend to blow the incident out of proportion.

25. When I fail at something that’s important to me, I tend to feel alone in my failure.

26. I try to be understanding and patient towards those aspects of my personality I don’t
like.
The Forms of Self-Criticizing/Attacking & Self-Reassurance Scale (FSCRS)

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 a 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.

Please use the scale below.

<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. 0 1 2 3 4
2. There is a part of me that puts me down. 0 1 2 3 4
3. I am able to remind myself of positive things about myself. 0 1 2 3 4
4. I find it difficult to control my anger and frustration at myself. 0 1 2 3 4
5. I find it easy to forgive myself. 0 1 2 3 4
6. There is a part of me that feels I am not good enough. 0 1 2 3 4
7. I feel beaten down by my own self-critical thoughts. 0 1 2 3 4
8. I still like being me. 0 1 2 3 4
9. I have become so angry with myself that I want to hurt or injure myself. 0 1 2 3 4
10. I have a sense of disgust with myself. 0 1 2 3 4
11. I can still feel lovable and acceptable. 0 1 2 3 4
12. I stop caring about myself. 0 1 2 3 4
13. I find it easy to like myself. 0 1 2 3 4
14. I remember and dwell on my failings. 0 1 2 3 4
15. I call myself names. 0 1 2 3 4

© Gilbert et al., 2004
<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>I am gentle and supportive with myself.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>17</td>
<td>I can't accept failures and setbacks without feeling inadequate.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>18</td>
<td>I think I deserve my self-criticism.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>19</td>
<td>I am able to care and look after myself.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>20</td>
<td>There is a part of me that wants to get rid of the bits I don't like.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>21</td>
<td>I encourage myself for the future.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>22</td>
<td>I do not like being me.</td>
<td>0 1 2 3 4</td>
</tr>
</tbody>
</table>
The Guilt and Shame Proneness scale (GASP)

Instructions: In this questionnaire you will read about situations that people are likely to encounter in day-to-day life, followed by common reactions to those situations. As you read each scenario, try to imagine yourself in that situation. Then indicate the likelihood that you would react in the way described.

1. After realizing you have received too much change at a store, you decide to keep it because the salesclerk doesn't notice. What is the likelihood that you would feel uncomfortable about keeping the money?

2. You are privately informed that you are the only one in your group that did not make the honor society because you skipped too many days of school. What is the likelihood that this would lead you to become more responsible about attending school?

3. You rip an article out of a journal in the library and take it with you. Your teacher discovers what you did and tells the librarian and your entire class. What is the likelihood that this would make you feel like a bad person?

4. After making a big mistake on an important project at work in which people were depending on you, your boss criticizes you in front of your coworkers. What is the likelihood that you would feign sickness and leave work?

5. You reveal a friend’s secret, though your friend never finds out. What is the likelihood that your failure to keep the secret would lead you to exert extra effort to keep secrets in the future?

6. You give a bad presentation at work. Afterwards your boss tells your coworkers it was your fault that your company lost the contract. What is the likelihood that you would feel incompetent?

7. A friend tells you that you boast a great deal. What is the likelihood that you would stop spending time with that friend?

8. Your home is very messy and unexpected guests knock on your door and invite themselves in. What is the likelihood that you would avoid the guests until they leave?

9. You secretly commit a felony. What is the likelihood that you would feel remorse about breaking the law?
10. You successfully exaggerate your damages in a lawsuit. Months later, your lies are discovered and you are charged with perjury. What is the likelihood that you would think you are a despicable human being?

11. You strongly defend a point of view in a discussion, and though nobody was aware of it, you realize that you were wrong. What is the likelihood that this would make you think more carefully before you speak?

12. You take office supplies home for personal use and are caught by your boss. What is the likelihood that this would lead you to quit your job?

13. You make a mistake at work and find out a coworker is blamed for the error. Later, your coworker confronts you about your mistake. What is the likelihood that you would feel like a coward?

14. At a coworker’s housewarming party, you spill red wine on their new cream-colored carpet. You cover the stain with a chair so that nobody notices your mess. What is the likelihood that you would feel that the way you acted was pathetic?

15. While discussing a heated subject with friends, you suddenly realize you are shouting though nobody seems to notice. What is the likelihood that you would try to act more considerately toward your friends?

16. You lie to people but they never find out about it. What is the likelihood that you would feel terrible about the lies you told?
Appendix H: State Measures

Experiential Shame Scale

Please indicate the number that best describes how you feel right now when comparing the two opposite word-states. For example, if you are feeling very warm (compared to very cool), mark 1; however, if you are feeling very cool (compared to very warm), mark 7. If you are feeling in-between the two states, find the number between 1 and 7 that best describes how you feel right now.

Physically, I feel:

1. Very Warm 1 2 3 4 5 6 7 R Very Cool
2. Normal Heartbeat 1 2 3 4 5 6 7 Rapid Heartbeat
3. Pale 1 2 3 4 5 6 7 Flushed

Emotionally, I feel:

4. Good 1 2 3 4 5 6 7 Bad
5. Clear 1 2 3 4 5 6 7 Confused
6. Content 1 2 3 4 5 6 7 Distressed
7. Calm 1 2 3 4 5 6 7 Highly Agitated/Aroused

Socially, I feel like:

8. Hiding 1 2 3 4 5 6 7 R Being Sociable
9. Talking 1 2 3 4 5 6 7 Being Quiet
10. No one sees me 1 2 3 4 5 6 7 People are looking at me
Visual Analogue Scales

Right now:

0----------------------------------------------------------100
I don’t feel compassionate towards myself at all

I feel very compassionate towards myself

0----------------------------------------------------------100
I feel like not being kind and understanding towards myself at all

I feel like being very kind and understanding towards myself

0----------------------------------------------------------100
I am not tolerant of my flaws and inadequacies at all

I am very tolerant of my flaws and inadequacies

0----------------------------------------------------------100
I don’t feel at all self-critical

I feel very self-critical
Appendix I: Loving Kindness Meditation Script

Script for Loving Kindness Meditation

Script for Loving Kindness Meditation clip (in the style of Loving-Kindness for Beginners (Neff))

Sit in a comfortable position, reasonably upright and relaxed. (Pause) Close your eyes fully or partly. (Pause) You will now be guided through a few minutes exercise.

Bring to mind a person with whom you have a positive relationship, someone who you feel naturally warmly towards. This could be a child, a grandparent, a former teacher or mentor your cat or dog - whoever naturally brings happiness to your heart. Allowing yourself to feel what it’s like to be in that being’s presence (pause for 2 sec).

(Pause)

Holding this person in mind now extending best wishes towards them. Repeat softly with this person in mind:

*May you be safe.*

*May you be peaceful.*

*May you be healthy.*

*May you live with ease.*

(Pause)

*May you be safe.*

*May you be peaceful.*

*May you be healthy.*

*May you live with ease.*

(Pause)

When you notice that your mind has wandered, return to the words and the image of the loved one you have in mind. Savour any warm feelings that may arise. Go slow.

(Pause)

Now add yourself to your circle of good will. Put your hand over your heart and feel the warmth and gentle pressure of your hand (for just a moment or for the rest of the exercise), saying:

*May I be safe.*

*May I be peaceful.*
May I be healthy.
May I live with ease.

(Pause)
May I be safe.
May I be peaceful.
May I be healthy.
May I live with ease.

(Pause)
Holding your body in awareness, notice any stress or uneasiness that may be lingering within you, and offer kindness to yourself.

May I be safe.
May I be peaceful.
May I be healthy.
May I live with ease.

Repeat the phrases inwardly with enough space between them so that they are pleasing you. As best you can, gather all your attention behind one phrase at a time. (Pause)

If you find your attention wandering, don’t worry, that’s what minds do. You can simply let go of distractions and begin from here you are.

May I be safe.
May I be peaceful.
May I be healthy.
May I live with ease. (Pause)

Feelings, thoughts, or memories may come and go; allow them to arise and pass away. Let the anchor be the repetition of these phrases:

May I be safe.
May I be peaceful.
May I be healthy.
May I live with ease. (Pause)

Just rest and sit quietly in your own body, savouring the good will and compassion that flows naturally from your own heart. Know that you can return to the phrases anytime you wish.

(Pause for 15 sec)
(Pause, then end) Now, in your own time, slowly open eyes. The exercise is over.
Appendix J: Script for Neutral Emotion Induction

Script for Neutral Condition Supermarket Scenario

Sit in a comfortable position, reasonably upright and relaxed. (Pause) Close your eyes fully or partly. (Pause) You will now be guided through a few minutes exercise.

We would like you to think about a normal or routine supermarket scenario. Try to think of a particular time that you visit a supermarket to do a large or weekly shopping. (Pause)

Think about arriving at the supermarket (Pause for 2 sec). What time in the day is it (Pause). Is it in the late morning or early afternoon? How does the supermarket look like? (Pause for 2 sec)

Think about why you are at the supermarket. (Pause)

How does it feels like being at the supermarket (Pause)

Try to feel the weather of that day. Is it could or warm? (Pause)

Feel the temperature (Pause)

Do you have plenty of time to do the shopping or are you in a rush (Pause)?

You may select a trolley to store your items or a shopping basket? (Pause for 3 sec)

See if it’s possible to think about what the trolley or shopping basket looks like. (Pause for 3 sec)

Feel the texture of the trolley or the shopping basket (Pause)

Now think about entering the shop (Pause for 3 sec).

Try to remember if you noticed anything special? (Pause for 3 sec)

Is the shop quiet and empty or is it crowded? (Pause)

Do you hear or see anything special (Pause for 3 sec) maybe a special offer (Pause for 3 sec).

What sounds do you hear? (Pause)

And now try to imagine which goods you come across first (Pause for 3 sec)

Think about walking down the first aisle (Pause for 3 sec).

Are there particular items you are looking for (Pause for 3 sec).

Play back what you were thinking in the situation. (Pause)

Now think about putting the items you need to buy into your trolley or shopping basket. (Pause for 3 sec)

Think about going through the shop aisle by aisle … (Pause for 8 sec)

......see if it is possible to imagine the shopping as much detailed as possible (Pause for 5sec).
You might come across the fruit and vegetable section (Pause).
Is there any particular smell that you notice (Pause) .....try to focus on them (Pause)
Do you have problems to reach an item? (Pause for 3 sec)
Do you have to reach up to a top shelf? (Pause for 3 sec)
Do you have to weight an item (Pause for 3 sec)
Try to feel the items (Pause)
Do you notice something special (Pause for 3 sec) .....or do you hear something special (Pause for 3 sec)
And now, think about going to the check-out/till to pay (Pause for 3 sec).
Think about putting your items out of the trolley or shopping basket (Pause for 3 sec).
Think about paying your purchases (Pause for 3 sec).
Are you paying by card or cash? (Pause for 3 sec)
Do you get some cash back (Pause for 3 sec).
Now think about putting your purchases back in the trolley or did you use a bag to carry them home? (Pause for 3 sec)
Think about taking your purchases home (Pause for 3 sec)

(Pause, then end) Now, in your own time, slowly open eyes. The exercise is over.
Appendix K: The Montreal Imaging Stress Task (MIST)

The Montreal Imaging Stress Task (MIST; Dedovic et al., 2005) was used as a PST to induce psychosocial evaluative stress. It includes a series of mental arithmetic tasks shown on a computer screen. Participants submit their answers using a keyboard. Following a practice, the MIST program calibrates task difficulty to just above the individual's capacity to solve the arithmetic ensuring that they get no more than 25 – 50% correct responses. Participants were informed that their performance was compared to the performance of other participants within the research and that they must achieve more than 90% of correct responses for their data to be included in the study; this was an unachievable standard. Additionally, a mock performance display indicated poor performance by the participant as compared to the average performance, and the experimenter provided negative feedback between each run of the arithmetic task. Participants engaged in a practice run with no time limit or negative feedback. This was followed by two 3 minute stress-inducing runs. The duration of the task is similar to that administered by Dedovic et al. (2005) within an imaging environment. Administration of MIST leads to robust increases in physiological and subjective stress measures making it a good laboratory-based stressor (Martens, Tunbridge, & Harrison, 2017).
Appendix L: Mood Repair - Recall of Positive Experiences in Life Script

“I am going to ask you to think about a situation or something that made you happy recently. I want you to think about it and you don’t have to tell me what it is. Just think about it for a moment. I am going to ask you some questions related to those moments that made you happy but again you can think about the answers to yourself without telling me what they are.

- Can you think about something that made you happy? Or something you really enjoyed? Think about it for a moment.
- Where were you? What did somebody do or what did you do that made you happy?
- How did you feel?
- Savour this experience for a moment.
- Whenever you are ready, you can finish this exercise.

Thank you.”
Appendix M: Baseline Measures for Demographics and Trait and State Measures

Table 6

Mean Scores for Group on Demographic Data, Trait Measures, and Baseline VAS

State Measures and Group Comparisons

<table>
<thead>
<tr>
<th>Variable at baseline</th>
<th>Range</th>
<th>NEU M (SD)</th>
<th>NEU Mdn* (n = 30)</th>
<th>LKM-S M (SD)</th>
<th>LKM Mdn (n = 32)</th>
<th>Test Statistic</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>18-41</td>
<td>21.53 (4.49)</td>
<td>20</td>
<td>22.72 (6.06)</td>
<td>20</td>
<td>U = 474.0</td>
<td>60</td>
<td>.93</td>
</tr>
<tr>
<td>Gender</td>
<td>48F, 14M</td>
<td>20 Female (67%)</td>
<td>28 Female (88%)</td>
<td>-</td>
<td>U = 465.0</td>
<td>60</td>
<td>.82</td>
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<tr>
<td>GASP-NSE</td>
<td>7-14</td>
<td>12.30 (2.10)</td>
<td>13</td>
<td>12.44 (1.66)</td>
<td>13</td>
<td>U = 404.5</td>
<td>60</td>
<td>.28</td>
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<tr>
<td>GASP-SW</td>
<td>3-19</td>
<td>8.83 (3.64)</td>
<td>9</td>
<td>7.81 (2.91)</td>
<td>7</td>
<td>U = 334.00</td>
<td>60</td>
<td>.04</td>
</tr>
<tr>
<td>PHQ-8</td>
<td>0-9</td>
<td>3.77 (2.75)</td>
<td>3</td>
<td>2.41 (2.38)</td>
<td>1.50</td>
<td>U = 325.00</td>
<td>60</td>
<td>.03</td>
</tr>
<tr>
<td>GAD-7</td>
<td>0-8</td>
<td>2.70 (2.12)</td>
<td>2</td>
<td>1.53 (1.37)</td>
<td>1</td>
<td>U = 320.0</td>
<td>60</td>
<td>.02</td>
</tr>
<tr>
<td>SCS self-kindness</td>
<td>6-25</td>
<td>14.77 (4.81)</td>
<td>14</td>
<td>17.09 (3.38)</td>
<td>17.50</td>
<td>U = 320.0</td>
<td>60</td>
<td>.02</td>
</tr>
<tr>
<td>SCS self-judgement</td>
<td>9-25</td>
<td>16.23 (4.90)</td>
<td>-</td>
<td>17.75 (3.65)</td>
<td>-</td>
<td>U = 410.0</td>
<td>60</td>
<td>.32</td>
</tr>
<tr>
<td>SCS common humanity</td>
<td>4-18</td>
<td>13.17 (3.11)</td>
<td>-</td>
<td>12.63 (3.67)</td>
<td>-</td>
<td>U = 449.0</td>
<td>60</td>
<td>.66</td>
</tr>
<tr>
<td>SCS isolation</td>
<td>6-20</td>
<td>13.10 (4.05)</td>
<td>13.50</td>
<td>14.03 (3.23)</td>
<td>15</td>
<td>U = 378.0</td>
<td>60</td>
<td>.15</td>
</tr>
<tr>
<td>SCS mindfulness</td>
<td>4-20</td>
<td>13.63 (3.20)</td>
<td>-</td>
<td>13.59 (3.08)</td>
<td>-</td>
<td>U = 432.50</td>
<td>60</td>
<td>.48</td>
</tr>
<tr>
<td>SCS over-identification</td>
<td>8-19</td>
<td>13.27 (2.24)</td>
<td>13</td>
<td>13.38 (2.06)</td>
<td>13</td>
<td>U = 378.0</td>
<td>60</td>
<td>.15</td>
</tr>
<tr>
<td>SCS total (1 – 130)</td>
<td>43-117</td>
<td>84.17 (16.45)</td>
<td>-</td>
<td>88.47(14.19)</td>
<td>-</td>
<td>U = 432.50</td>
<td>60</td>
<td>.43</td>
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<tr>
<td>FSCRS-IS</td>
<td>1-27</td>
<td>15.37 (7.37)</td>
<td>16</td>
<td>12.59 (7.18)</td>
<td>23.50</td>
<td>U = 387.0</td>
<td>60</td>
<td>.15</td>
</tr>
<tr>
<td>FSCRS-RS</td>
<td>6-32</td>
<td>21.63 (6.35)</td>
<td>-</td>
<td>22.75 (4.52)</td>
<td>-</td>
<td>U = 432.50</td>
<td>60</td>
<td>.43</td>
</tr>
<tr>
<td>FSCRS-HS</td>
<td>0-9</td>
<td>1.80 (2.28)</td>
<td>1</td>
<td>1.78 (2.64)</td>
<td>0</td>
<td>U = 432.50</td>
<td>60</td>
<td>.43</td>
</tr>
<tr>
<td>Subscale</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>t</td>
<td>df</td>
<td>p</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>-------</td>
<td>----</td>
<td>-----</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC Composite †</td>
<td>16.98 (3.34)</td>
<td>16.98 (3.34)</td>
<td>-</td>
<td>-</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-criticism</td>
<td>0-100 (25.39)</td>
<td>0-100 (25.39)</td>
<td>-</td>
<td>-</td>
<td>.05</td>
<td></td>
<td></td>
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<tr>
<td>ESS Distress</td>
<td>1-5</td>
<td>1-5</td>
<td>-</td>
<td>-</td>
<td>.96</td>
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<td></td>
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<tr>
<td>ESS</td>
<td>4-18</td>
<td>4-18</td>
<td>-</td>
<td>-</td>
<td>.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESS physical</td>
<td>4-20</td>
<td>4-20</td>
<td>-</td>
<td>-</td>
<td>.77</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESS emotional</td>
<td>4-20</td>
<td>4-20</td>
<td>-</td>
<td>-</td>
<td>.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESS social</td>
<td>5-15</td>
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<td>-</td>
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<td>.48</td>
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<td>ESS total (10-70)</td>
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<td>-</td>
<td>.58</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Note. GASP-NSE, The Guilt and Shame Proneness Scale with Negative Self-evaluation Subscale; GASP-SW, The Guilt and Shame Proneness Scale shame with Shame Withdraw Subscale; ESS, Experiential Shame Scale; LKM-S, Loving Kindness Meditation for the Self; PHQ-9, Patient Health Questionnaire; SCS, Self Compassion Scale; FSCS, Functions of Self-Criticizing Scale; † Composite of Compassion, Kindness, and Tolerance, Visual Analogue Scale scores; FSCRS, The Forms of Self-Criticizing/Attacking Reassuring Scale, *Mdn was provided for non-parametric tests.
Appendix N: Guidelines for Authors

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DESCRIPTION

The major focus of Behaviour Research and Therapy is an experimental psychopathology approach to understanding emotional and behavioral disorders and their prevention and treatment, using cognitive, behavioral, and psychophysiological (including neural) methods and models. This includes laboratory-based experimental studies with healthy, at risk and subclinical individuals that inform clinical application as well as studies with clinically severe samples. The following types of submissions are encouraged: theoretical reviews of mechanisms that contribute to psychopathology and that offer new treatment targets; tests of novel, mechanistically focused psychological interventions, especially ones that include theory-driven or experimentally-derived predictors, moderators and mediators; and innovations in dissemination and implementation of evidence-based practices into clinical practice in psychology and associated fields, especially those that target underlying mechanisms or focus on novel approaches to treatment delivery. In addition to traditional psychological disorders, the scope of the journal includes behavioural medicine (e.g., chronic pain). The journal will not consider manuscripts dealing primarily with measurement, psychometric analyses, and personality assessment. The Editor and Associate Editors will make an initial determination of whether or not submissions fall within the scope of the Journal and/or are of sufficient merit and importance to warrant full review.

AUDIENCE

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

IMPACT FACTOR

2018: 4.309 © Clarivate Analytics Journal Citation Reports 2019
GUIDE FOR AUTHORS

INTRODUCTION
The major focus of *Behaviour Research and Therapy* is an experimental psychopathology approach to understanding emotional and behavioral disorders and their prevention and treatment, using cognitive, behavioral, and psychophysiological (including neural) methods and models. This includes laboratory-based experimental studies with healthy, at risk and subclinical individuals that inform clinical application as well as studies with clinically severe samples. The following types of submissions are encouraged: theoretical reviews of mechanisms that contribute to psychopathology and that offer new treatment targets; tests of novel, mechanistically focused psychological interventions, especially ones that include theory-driven or experimentally-derived predictors, moderators and mediators; and innovations in dissemination and implementation of evidence-based practices into clinical practice in psychology and associated fields, especially those that target underlying mechanisms or focus on novel approaches to treatment delivery. In addition to traditional psychological disorders, the scope of the journal includes behavioural medicine (e.g., chronic pain). The journal will not consider manuscripts dealing primarily with measurement, psychometric analyses, and personality assessment.

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Contact details
Any questions regarding your submission should be addressed to the Editor in Chief:
Professor Michelle G. Craske
Department of Psychology
310 825-8403
Email: brat@psych.ucla.edu

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  - Full postal address
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    - Include keywords
  - All figures (include relevant captions)
  - All tables (including titles, description, footnotes)
  - Ensure all figure and table citations in the text match the files provided

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  Graphical Abstracts / Highlights files (where applicable)
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Appendix O: Dissemination Plan

The results of this study will be disseminated through presentation, feedback and journal publication.

**Dissemination to participants**

Participants who expressed interest in this study’s findings will be informed of the results of the study. Participants will be given details of who to contact if they wish to receive further information about the research.

**Journal Publication**

This research will be prepared for submission to a peer-reviewed journal Behaviour Research and Therapy in September 2020 for dissemination to a wide academic audience.

**Presentation**

The empirical research will be presented to trainee clinical psychologists and staff from the Exeter DClinPsy programme in June 2020.