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University of Southampton

Faculty of Environmental and Life Sciences

School of Psychology

**Exploring the Efficacy of both Compassionate Writing and Imagery in the
management of Post Event Processing within Social Anxiety**

by

Jonathan Richards

Thesis for the degree of Doctorate of Clinical Psychology

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Abstract

FACULTY OF ENVIRONMENTAL AND LIFE SCIENCES

School of Psychology

Thesis submitted for the degree of Doctorate in Clinical Psychology

Exploring the Efficacy of both Compassionate Writing and Imagery in the management of Post Event Processing within Social Anxiety

by Jonathan Richards

A systematic literature review explored the effect of compassion-based interventions on the transdiagnostic process of repetitive negative thinking. 18 interventional studies were narratively synthesised, with results offering preliminary support for the positive impact of increasing self-compassion on reducing repetitive negative thinking. However, variations in efficacy were indicated across interventional formats and disorder specific domains of repetitive thinking, which require further investigation. Areas for methodological refinement and future research are proposed in order to further elucidate the mechanisms in which compassion-based interventions may operate upon repetitive thinking within psychological disorders.

An empirical study compared the efficacy of two compassion-based exercises on post event processing, a form of repetitive negative thinking evidenced to maintain social anxiety. A socially anxious analogue sample ($N = 81$) completed an impromptu speech and were randomly assigned to a compassionate imagery, compassionate writing, or reflective control condition. Baseline measures of self-compassion, post event processing, affect, willingness to communicate, performance appraisal and self-esteem were completed, and repeated immediately following the experimental manipulation or at 24-hour follow up. Compared to a control group, the compassionate imagery condition experienced significant improvements in post event processing, affect, self-compassion, performance perception and state self-esteem. The compassionate writing condition showed similar benefits, aside from reductions in post event processing, which were found to be non-significant. Additionally, the compassionate imagery condition reported significant improvements in negative affect when compared to the compassionate writing condition. Findings support preliminary evidence of the utility of implementing brief compassion-based interventions following situations of ambiguous, social threat.

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Research Thesis: Declaration of Authorship

Print name: Jonathan Richards

Title of thesis: **Exploring the Efficacy of both Compassionate Writing and Imagery in the management of Post Event Processing within Social Anxiety**

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission

Signature:

Date: 16/05/2020

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Chapter 1 Do Brief Compassion Based Interventions lead to a Reduction in Repetitive Negative Thinking. A Systematic Review.

1.1 Introduction

Within the field of psychopathology, there has been longstanding debate around how best to conceptualise, classify and treat an expanding number of categorised mental health problems (Varga, 2012). Within cognitive-behavioural psychotherapy, intervention research has trended towards the development of evidenced-based therapeutic protocols specific to discrete mental health problems, such as depression, panic and social anxiety (Hoffman & Hayes, 2019). Such a directive can be traced to the predominance of a symptom focussed, medical illness framework of clinical research funding, until recently advocated by agencies such as the National Institute of Mental Health (Insel, 2010).

Although this framework has significantly advanced the knowledge base and the progression of intervention science, in recent years there has been a paradigm shift from this perspective in response to both the high levels of heterogeneity within, and comorbidity between, clinical diagnoses (Hofmann & Hayes, 2019; Insel et al., 2010). Specifically, it has been argued that a potentially efficacious, parsimonious and flexible approach may instead lie in the holistic formulation and contextual intervention of the range of mechanisms shared across mental health problems; collectively defined as transdiagnostic processes (Krueger & Eaton, 2015; Mansell et al., 2008).

Rather than focussing on the heterogenous taxonomy of syndromes, transdiagnostic processes are conceptualised as problematic forms of cognitive-affective, interpersonal, and behavioural features which globally occur on a continuum. These include processes such as repetitive negative thinking, perfectionism, attentional biases and emotional dysregulation (Aldao et al., 2016; Egan et al., 2011; Garland & Howard, 2014). The current review focuses on the phenomenon of repetitive negative thinking (RNT; Ehring

and Watkins, 2008), as emerging evidence has identified this as a critical maintaining process across a range of mental health difficulties (Arditte et al., 2016; Wahl et al., 2019).

1.1.1 Repetitive Negative Thinking

RNT can be defined as a thinking style which is “repetitive, passive or relatively uncontrollable and focussed on negative content” (Ehring & Watkins, 2008, p. 193). Although repetitive thinking in general may act constructively, such as to aid in the mental preparation and planning of upcoming challenging events or to effectively process traumatic experiences (Watkins, 2008); RNT in contrast has an unworkable function and can vary in content, valence and temporal orientation (Martin & Tesser, 1996). For example, RNT can be further subdivided to include phenomena such as post event processing (Clark & Wells, 1995), depressive rumination (Nolen-Hoeksema, 1998), and worry (Borkovec et al., 1983). Post event processing can be defined as a negative ‘post-mortem’ self-evaluation of social performance, which occurs specifically following social situations (Clark & Wells, 1995). Depressive rumination alternatively has been conceptualised as a passive focus on one’s depressive symptoms and their possible causes or consequences (Nolen-Hoeksema, 1991). In contrast, worry is typically orientated towards future uncertain events which are perceived as threatening and likely to have a negative outcome ([Sibrava & Borkovec, 2006](#)). Although individually distinctive, each of these cognitive processes share similarities in their repetitiveness, intrusiveness, uncontrollability, and unproductive use of mental capacity (Wahl et al., 2019).

Forms of RNT contribute to the maintenance of a multitude of mental health difficulties, including depression (Beck, 2008), post-traumatic stress disorder (Ehlers & Clark, 2000), social phobia (Clark & Wells, 1995) generalised anxiety (Wells, 2006) and eating disorders (Cooper, 2012). Indeed, in a prospective study following a sample of 137 initially non-depressed college participants over a period of two and a half years, a ruminative response style mediated the relationship between four hypothesised risk factors

for the development of depression (Spasojević & Alloy, 2001). Although depressive symptomatology was assessed utilising the now outdated DSM-III-R, this study identified rumination as a proximal mechanism related to depressive risk. In comparison, studies exploring the impact of worry within anxiety presentations have found it to elevate sympathetic nervous activity, such as by lowering heart rate variability (Brosschot et al., 2007) and increasing threat perception (Stapinski et al., 2010). Furthermore, in assessing the overlap of rumination within comorbid depression and anxiety, McLaughlin and Nolen-Hoeksema (2011) conducted two large scale longitudinal studies within both adolescent and adult populations. Prospectively, rumination was found to fully mediate the relationship between baseline depression and anxiety within adolescents; whereas in adults, rumination mediated the association between both baseline anxiety and depression on future symptom severity. Although the correlational analyses employed are limited in their ability to establish causality (Hung et al., 2017), these findings highlight the importance of clinically targeting repetitive negative thinking within therapeutic intervention.

There is a growing range of empirically efficacious process-based therapies which aim to conceptualise and target transdiagnostic mechanisms such as RNT; including transdiagnostic variants of cognitive behaviour therapy (CBT) and mindfulness and acceptance based treatments (Barlow et al., 2011; Newby et al., 2015). Additionally, there has been recent development of interventions which specifically aim to ameliorate aspects of RNT, such as Rumination Focussed CBT (RF-CBT, Watkins, 2016). However, from the field of positive psychology, it has been recently suggested that improving individuals' levels of self-compassion may be an alternate means of protecting against RNT (Wadsworth et al., 2018). Indeed, Allen and Knight (2005) have previously proposed that improving self-compassion may operate therapeutically upon depression through lessening the impact of rumination; possibly by buffering against self-critical, judgemental and

isolating thoughts (Leary et al., 2007). The underpinnings of self-compassion, alongside its potential as a therapeutic intervention for RNT will now be briefly discussed.

1.1.2 The Potential Role of Self-Compassion

The generic concept of compassion has been defined in varying forms across spiritual and therapeutic contexts, which is likely to reflect the multidimensional nature of the construct (Strauss et al., 2016). Originating from Buddhist philosophy, the Dalai Lama (1995, p. 16) defines compassion as “a sensitivity to suffering in the self and others, with a deep commitment to try to relieve it”. This conceptualisation aligns with contemporary definitions from leading motivational theorists (Gilbert, 2017), who emphasise that compassion requires the openness to consciously turn towards, rather than away from suffering with the mindset of warmth, wisdom, courage and resilience. This action then facilitates a further evaluation of strategies which may be employed to respond to need in oneself or others, which in turn serve to alleviate suffering. Outwardly, this may present differently depending on the context: from a firefighter entering a burning building to aid a stranger, a mother soothing her child, to an individual acting self-compassionately during a difficult moment (Gilbert, 2017). According to Gilbert, self-compassion is expressed through a range of attributes, including sensitivity, sympathy, empathy, motivation, caring and distress tolerance. These attributes are situated within an evolved care-giving ‘soothing’ emotional regulation system, developed from a range of biological, attachment and social processes (Gilbert, 2009). However, to enable self-compassion, Gilbert proposes that a tripartite balance is required between this affiliative system and two competing ‘threat’ and ‘drive’ systems. The threat system is responsible for scanning, identifying and responding to perceived physical and social threat, and utilises hormones such as adrenaline and cortisol to engage the bodies sympathetic nervous system in freeze, appease, flight and fight behavioural responses. The drive system alternatively is concerned with resource acquisition, and is influenced by the hormone dopamine to reward

the pursuit of both physical (e.g., food and shelter) and socially-rank focussed resources (e.g., status and material possessions). Although each of these more primitive motivational systems are key to our survival, Gilbert proposes that within modern society many individuals commonly oscillate between their threat and drive systems, to the neglect of their soothing system. Gilbert proposes this to be due to a complex web of evolutionary-neurodevelopmental biases, attachment difficulties and culturally competitive, rank-focussed social narratives, which can lead to an increase in shame, self-criticism and a lack of self-compassion (Gilbert, 2014).

An alternative conceptualisation focussing specifically on self-compassion has been proposed by Neff (2003a), who operationalises self-compassion into three components: (a) mindfulness, (b) awareness of common humanity and (c) self-kindness. Mindfulness in the context of self-compassion involves bringing awareness towards distressing emotions and thoughts as they occur in the moment, with flexible, balanced acceptance. Awareness of common humanity describes being reflective of one's state of suffering as a natural experience of the human condition, universally shared by others. Self-kindness refers to bringing a sense of warmth and understanding in the face of one's own difficulties, as you might do to a friend or loved one (Neff, 2003a). On the opposing side of these dimensions, Neff defines the unhelpful processes of overidentification, isolation and self-judgement. Overidentification describes becoming 'swept up', with difficult experiences, letting suffering become all-encompassing of one's perception. Isolation refers to feeling as if one is alone in one's suffering, whereas self-judgement involves approaching one's failings and struggles from a perspective of coldness. It is these dimensions of self-compassion which are thought to occur within RNT (Wadsworth et al., 2018), which suggests that building a compassionate mindset may lead to a reduction in the frequency and intensity of this unhelpful thinking process.

1.1.3 Compassion-Based Interventions and RNT

There is increasing evidence demonstrating that interventions such as Mindful Self Compassion (MSC; Neff & Germer, 2013) and Compassion Focussed Therapy (CFT; Gilbert, 2014a) are effective in both increasing self-compassion and reducing clinical symptomatology in a range of mental health problems (e.g., Kirby et al., 2017; Leavis & Uttley, 2015). However, at present much of the above evidence base has concentrated on the impact of self-compassion on global psychopathology, without exploration of the potential effect upon underlying processes of change, such as RNT.

There is a growing body of evidence which demonstrates that self-compassion is consistently negatively correlated with various types of RNT in both clinical and subclinical populations. These include depressive, grief and body image rumination (Kreiger et al., 2013; Fresnics et al., 2019; Lenferink et al., 2017; Maraldo et al., 2016), worry (Hoge et al., 2013; Raes, 2010) and post event processing (Blackie & Kocovski, 2018a). However, as correlational designs, these studies are limited in that they do not provide an indication of causality or directionality (Hung et al., 2017). Specifically, when correlational methods are used, the observed association between variables is vulnerable to bias from anything that was not measured. As such, there is a need to explore the existing literature of compassion-based interventional research, to discern the causal effect of developing self-compassion on RNT.

Partly addressing this gap in the evidence base, Ferrari et al. (2019), recently conducted a meta-analysis of 27 randomised controlled trials (RCT) of compassion-based interventions across a range of populations. The review explored 11 psychosocial outcomes, including affect, stress, self-criticism and eating behaviours. Notably, four studies in this review explored a subcomponent of RNT, namely: depressive rumination (Armstrong & Rimes., 2016; Dundas et al., 2017; Mosewich et al., 2013; Smeets et al., 2014). All four studies showed that depressive rumination significantly reduced following the interventions, comparatively more than improvements in depressive and anxiety

symptoms. Ferrari and colleagues concluded that compassion-based interventions may be a useful means to reduce rumination across multiple presentations, through fostering a more adaptive thinking process. However, it is important to consider that this conclusion was derived from a limited number of studies, which may impact on the generalisability of the reported outcomes (Polit & Beck, 2010). Furthermore, although RCT's are widely considered the 'gold standard' of clinical research, they are often conducted under idealised, rigorous conditions. In particular, such designs can fail to accurately represent minority populations or those with comorbid conditions, which can limit the ecological validity of findings (Insel et al., 2010). To address this, it can be useful to synthesise and compare findings from RCT's with smaller scaled, pragmatic designs which may be more representative of those with complex, transdiagnostic presentations (Nathan et al., 2000). In support, when synthesising their findings, Ferrari et al. (2019) acknowledged that publication bias may exist, further limiting the validity of the reported effects.

As such, given the preliminary nature of this topic area, it is pertinent to extend Ferrari et al.'s (2019) previous findings across a wider range of methodological designs. This includes quasi-experimental, case study and uncontrolled methodologies, to gain a comprehensive insight into the current evidence base. Furthermore, although rumination was addressed within this recent review, additional cognitive processes encapsulated within the construct of RNT, such as worry and PEP were not explored. This poses additional questions as to whether the varying sub-components of RNT may differ in response to the possible buffering action of self-compassion.

It is also of note that Ferrari et al. (2019) included all studies that explicitly discussed self-compassion within the intervention, however minor. As one study in this review followed a predominantly Mindfulness Based Cognitive Therapy protocol (MBCT; Armstrong & Rimes, 2016), this poses questions as to what may have been the responsible mechanism of change. As mindfulness-based interventions have been evidenced to reduce ruminative thinking and implicitly increase self-compassion (Van der Velden et al., 2015),

it is unclear if interventions which aim to explicitly cultivate self-compassion differ in their effect.

1.1.4 Aims of the Present Review

The current review aims to explore the full extent of the literature on the impact of self-compassion-based interventions on the transdiagnostic process of RNT. Specifically, three questions are considered: (a) Are the preliminary findings into the effects of self-compassion on depressive rumination reported in Ferrari et al's. (2019) review consistent across a broader range of study designs? (b) How might compassion-based¹ interventions impact upon other domains of RNT, such as post-event processing or worry? (c) Are there any observable variations in efficacy across compassion-based modalities and intervention protocols?

This review of the literature will therefore allow further understanding of the interplay between self-compassion and RNT, and look to identify inconsistencies and gaps in the evidence base for future research.

¹Interventions which aim to develop self-compassion, although developing compassion towards others may also be a component.

1.2 Method

1.2.1 Search Strategy

To confirm that no previous reviews exploring the effects of self-compassion on RNT existed or were pre-registered, exploratory searches were conducted within online platforms including the Cochrane database, Google scholar and PROSPERO. This established that other than Ferrari et al.'s (2019) previous meta-analysis which the current review aimed to build upon, no reviews had yet explored the interplay between the constructs of interest. Therefore, following the identification of key search terms through a scoping review of the literature (Booth et al., 2016), a systematic literature search was conducted on the 11th of November 2019 using the following databases: PsychINFO, MEDLINE, CINAHL Plus with Full Text (each via EBSCO) and Web of Science Core Collection. Additionally, a search was conducted on the Open Dissertations database, as a means to identify unpublished studies of relevance as an attempt to reduce publication bias. Table 1 contains a full list of search terminology used to capture the two constructs of self-compassion and RNT.

Table 1.
Search strategy entered into databases.

	Repetitive Negative Thinking (S1)	AND	Self-Compassion (S2)
Search Terminology	Ruminat* OR “post event process*” OR Worry OR Worri* OR (Repetitive N2 negative (thinking OR thought*)) OR “anticipatory process*”		Self N1 Compassion* OR Compassion*

This search combination was run with Boolean operators with no restrictions placed on date, language or publication. The resulting articles were combined in the Endnote reference management software package, which automatically removed duplicates. The remaining articles were then initially screened by title and abstract by the author. Following the recommendations of Lipsey and Wilson (2001), a randomly selected ten

percent of article abstracts were independently reviewed by a secondary researcher (a trainee clinical psychologist) as an inter-rater reliability check. Any discrepancies between the two reviewers as to the suitability of abstracts were included for full text review as a conservative strategy. Full texts were then scrutinised against predetermined eligibility criteria, structured within a Population, Intervention, Comparison, Outcomes and Study Design framework (PICOS; Methley et al., 2014, see table two). Ten percent of these full texts were once again randomly selected and screened by a secondary researcher to ensure the appropriate application of selection criteria. There were no discrepancies between researchers at this stage. Searches were rerun close to finalisation of the review to ascertain if any additional relevant dissertations or peer reviewed articles had been disseminated. Both backwards and forward citation chaining was completed on all selected articles of interest, as a means to identify any additional articles of relevance.

Table 2.
Eligibility criteria for study selection.

	Inclusion	Exclusion
Population	<ul style="list-style-type: none"> • Participants of any gender above the age of 18. • Any participants explored in the context of mental wellbeing (e.g., clinical, analogue, non-clinical) 	<ul style="list-style-type: none"> • Participants under the age of 18.
Intervention	<ul style="list-style-type: none"> • Therapeutic interventions with an explicit aim of developing self-compassion. • Any theoretical model of self-compassion may underpin the intervention. • Self-compassion intervention techniques can be part of any therapy as long as self-compassion is the primary component. • Interventions of any duration or setting. 	<ul style="list-style-type: none"> • Interventions with no explicit focus on manipulating self-compassion (for example, a mindfulness-based approach.) • Interventions whereby self-compassion is addressed as a minor component of a larger intervention, for example, one session incorporating Loving Kindness Meditation amongst a wider MBCT programme.
Comparison	<ul style="list-style-type: none"> • May be any form of comparison group (e.g., waitlist, active control) or alternatively have no comparator group. 	
Outcomes	<ul style="list-style-type: none"> • Must contain a validated or empirically supported measure of RNT, administered both prior to and following the intervention. 	<ul style="list-style-type: none"> • Does not report significance values. • Refers to constructs that are not types of RNT from a theoretical point of view (e.g., metacognitive beliefs). • Studies in which RNT or self-compassion is measured in trait form as mediators/moderators for change in other study variables.
Study design and publication format	<ul style="list-style-type: none"> • Any quantitative interventional study design (e.g., RCT, quasi-experimental, case series). • Written in English. • Peer reviewed articles and unpublished dissertations. 	<ul style="list-style-type: none"> • Qualitative or correlational studies, theoretical articles, reviews and book extracts. • Non-English articles.

1.2.2 Quality Assessment Measure

The Standard Quality Assessment Criteria of Evaluating Primary Research from a Variety of Fields (QualSyst; Kmet et al., 2004) was selected as a means to systematically judge study quality across a range of methodological designs. As there is no general consensus on what may constitute a ‘gold standard’ appraisal tool, the QualSyst sought to ensure that all study designs could be objectively appraised on a comparable platform. The Qualsyst comprises of 14 checklist appraisal items, which review the methodological appropriateness of factors including participant selection methods, study design, blinding, confounding elements and analytical strategy. An overall score is calculated for each study, up to a maximum of 28, although this number is reduced for studies where particular questions may not be applicable. From this total score, a summary score ranging between 0 and 1 is calculated by dividing the total score by the maximum number of points available for the study design, with a higher score being indicative of better methodological quality. For example, if a study scored a total of 20 out of a possible 22 points, a summary score of .91 would be derived. This method allows for a degree of comparability between studies with varying designs. In addition, as the QualSyst tool provides no standardised means to assess reporting bias, this was examined qualitatively as recommended by alternative quality rating tools used within both randomised and non-randomised study designs (Higgins et al., 2011; Sterne et al., 2016). To reduce the potential for subjective bias in quality rating, all studies were independently reviewed by both the author and a secondary researcher. Analysis using intraclass correlation coefficient indicated good interrater reliability between each researchers’ independent quality ratings (ICC = .765, 95% CI .361 - .912; Koo & Li, 2016), with discrepancies then discussed and mutually resolved.

1.3 Results

Amalgamating searches from each of the five databases resulted in a combined total of 817 articles. In total, 281 of these were removed as duplicates, leaving 536 articles for title and abstract screen. Screening of these articles resulted in 458 being excluded against the predetermined selection criteria. The main reasons for exclusion were that these studies did not focus on RNT as an outcome variable, were correlational, qualitative or theoretical in design or did not include a compassion-based intervention. After exclusion, 78 articles remained for full text review. From these, 15 studies did not contain an appropriate measure of RNT. Next, 37 studies were either interventions that did not explicitly aim to manipulate self-compassion (e.g. MBCT, Mindfulness Based Stress Reduction; MBSR), or they only contained a limited application of compassion-based techniques (such as one session comprising of a singular Loving Kindness Meditation practice within a wider treatment programme). Three studies were not written in English and one text could not be obtained from the author for screening. Finally, six studies were experimental designs exploring the effects of trait rumination or self-compassion as mediators of outcomes separate to the aims of the review, such as affect (see figure 1 for a PRISMA flow diagram summarising the search process in full). In reviewing the references of full texts, two further studies were identified as relevant (Harwood & Kocovski, 2017; Talbot et al., 2016). This resulted in a total of 18 articles eligible for final inclusion.

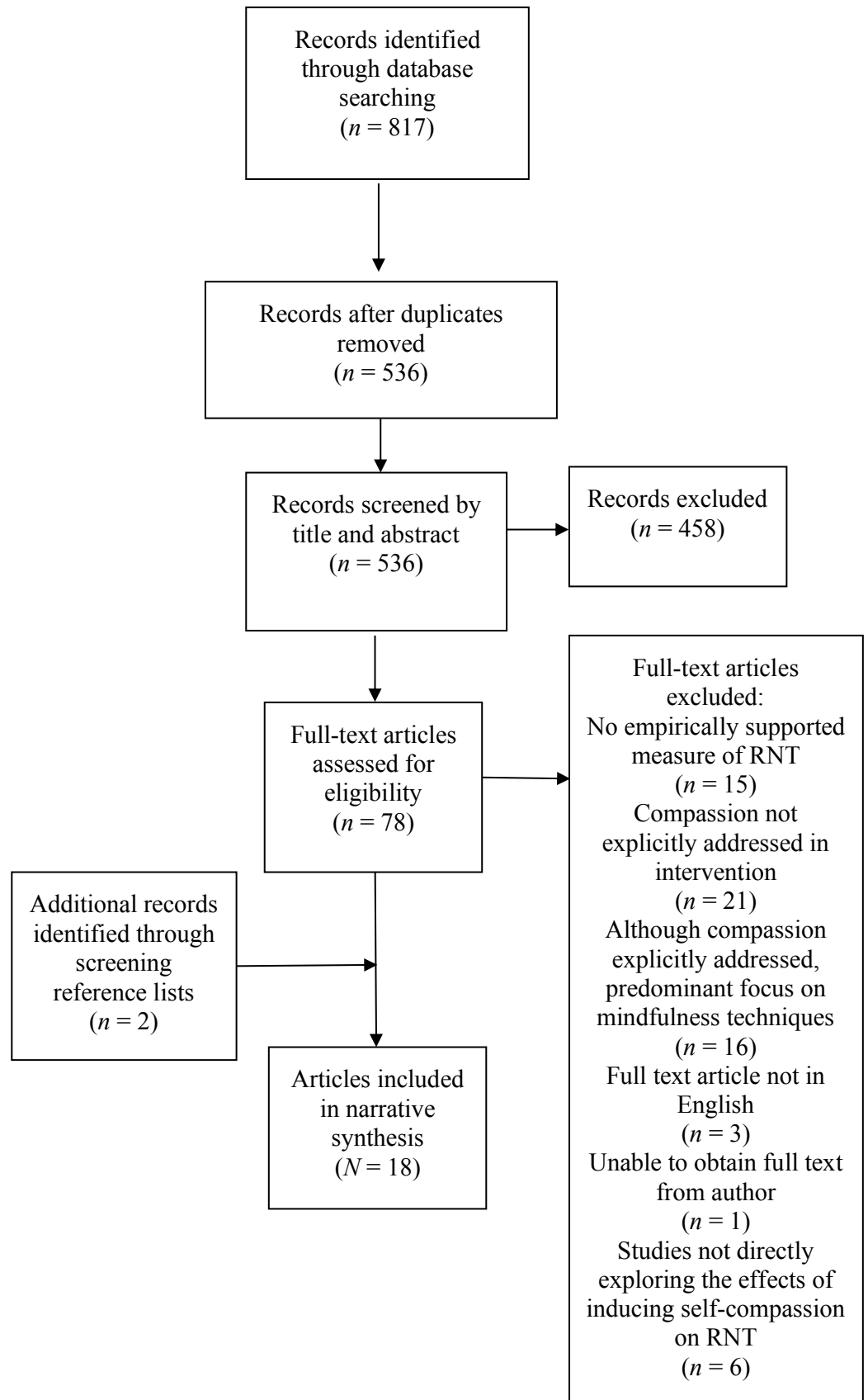


Figure 1. *PRISMA (2009) diagram depicting study screening and selection.*

1.3.1 Study Characteristics

Of the 18 articles included for full text review, four combined multiple sub-studies (Butz & Stahlberg, 2018; Johnson & O'Brien, 2013; Hofmann et al., 2015; Polizzi et al., 2019). Butz and Stahlberg (2018) comprised three studies, of which the first study was correlational in design and so not relevant. Study two included an empirically valid measure of RNT and so was appropriate; however, study three replaced the RNT measure with the Pre-Sleep Arousal Scale (Nicassio et al., 1985). Although the latter includes cognitive elements applicable to RNT (e.g., "can't shut off your thoughts"), it also includes cognitive and somatic questions not applicable to RNT, and therefore was not considered appropriate. Both sub-studies contained within Hofmann et al. (2015) were suitable for inclusion and are reported separately in Table 3. One of the studies in Johnson and O'Brien (2013) was correlational in design, and therefore was excluded from the current review. Only study two was suitable for inclusion within Polizzi et al. (2019) as it utilised a LKM intervention, rather than a general mindfulness exercise.

1.3.1.1 Research design

In total, 11 of the 18 articles used a randomised controlled design, of which three were included in the Ferrari et al. (2019) meta-analysis (Dundas et al., 2017; Mosewich et al., 2013; Smeets et al., 2014). The remaining studies were quasi-experimental designs, aside from one that was a single case series (Talbot et al., 2017). Studies were conducted predominantly within Western nations, including the US (Hofmann et al., 2015, study one; Jazaieri et al., 2014; Kirkpatrick, 2005; Polizzi et al., 2019; Rose et al., 2018), Canada (Blackie & Kocovski, 2018b; Harwood & Kocovski, 2017; Johnson & O'Brien, 2013; Mosewich et al., 2013; Talbot et al., 2016), the UK (Thomas, 2010), Germany (Butz & Stahlberg, 2018; Hofmann et al., 2015, study two; Graser et al., 2016), Norway (Dundas et al., 2017), Iceland (Frostadottir & Dorjee, 2019) and the Netherlands (Schuling et al., 2018; Smeets et al., 2014). One study was conducted within China (Finlay-Jones et al.,

2018). The majority of studies were peer reviewed articles, with two unpublished doctoral dissertations (Kirkpatrick, 2005; Thomas, 2010).

1.3.1.2 Samples

Notably, 12 studies used student samples, often in receipt of monetary payment or student credit for participation. The remainder were conducted within community health settings, aside from one within a residential rehabilitation unit (Frostadottir & Dorjee, 2019). Study samples ranged from 9 to 158 participants, with all reporting gender distributions and mean participant ages, the latter ranging from 18.65 (Blackie & Kocovski, 2018b) to 53.4 (Schuling et al., 2018).

Only three studies used clinical samples that had been pre-screened for the presence of a formal diagnosis of an affective difficulty such as dysthymia or recurrent depression (Graser et al., 2016; Hofmann et al., 2015; Schuling et al., 2018). Five studies did not use any pre-determined screening criteria, and explored the impact of self-compassion on RNT within the context of healthy self-regulation (Butz & Stalhberg, 2018; Finley-Jones et al., 2018; Dundas et al., 2017; Polizzi et al., 2019; Smeets et al., 2014). The remainder used a range of methods to capture subclinical, analogue samples. These included screening participants using predetermined cut-offs from validated measures of psychopathology or self-criticism, to idiosyncratic methods (for example, participants self-identifying as self-critical in a way that is “less than constructive”; Mosewich et al., 2013).

1.3.1.3 Format of interventions

With regards to the format of the compassion-based interventions, nine studies used a group approach, with interventions spanning from three to 12 sessions. Within these, there were further variations in the theoretical models drawn upon. Five utilised a single model specific therapeutic approach. This included Mindful Self Compassion (Finlay-Jones et al., 2018); an approach based upon Neff’s (2003a) proposed model of self-compassion, rooted within the principles of Theravada Buddhism. Others studies utilised Loving Kindness Meditation (LKM; Hofmann et al., 2015, study one and two; Polizzi et al., 2019); an

intervention drawing upon a series of guided meditative techniques to develop a *metta* state of unselfish and unconditional kindness to the self and all beings. Compassion Focussed Therapy was the final theoretical framework (Frostadottir & Dorjee, 2019), which differed by incorporating an evolutionary approach in the psychoeducation of Gilbert's (2009) three emotion-regulation systems described previously, in addition to integrative techniques such as compassionate imagery. The remaining group interventions combined elements of each of these approaches within a combined framework (Dundas et al., 2017; Graser et al., 2016; Jazaieri et al., 2014; Schuling et al., 2018; Smeets et al., 2014).

Of the remaining nine studies which did not follow a group-based therapeutic protocol, six sought to develop participants' self-compassion through a single technique. Four of these administered a compassionate writing task (Blackie & Kocovski, 2018b; Harwood & Kocovski, 2017; Johnson & O'Brien, 2013; Thomas, 2010). Butz and Stahlberg (2018) also used this technique, but compared it to an LKM audio exercise. Additionally, Kirkpatrick (2005) implemented an adapted Gestalt two-chair intervention. The remaining studies used a series of sessions or exercises completed independently, as home practice (Mosewich et al., 2013; Talbot et al., 2016), or within a one-to one therapeutic context (Rose et al., 2018).

1.3.1.4 Outcome measures

The majority of studies measured self-compassion using Neff's (2003b) Self Compassion Scale (SCS) in either its original or translated form, although two studies used a short form version of the scale (SCS-SF; Dundas et al., 2017; Blackie & Kocovski, 2018b). In considering the validity of these measures, although demonstrating adequate psychometric properties (Neff et al., 2007; Raes et al., 2011) there is ongoing debate around the utility of the total scale-score of the SCS, compared to individually exploring each of the measure's six sub-domains (Muris et al., 2018). However, Neff et al. (2019) has recently provided support for both the usage of either a total scale score or individual subscales of the SCS through analysis of a large secondary sample. Within the current

review, total scale scores were calculated by all studies to measure either trait or state self-compassion, with the exception of Schuling et al. (2018), who analysed each of the subscales of the SCS separately. Of particular note, Thomas (2010), Harwood and Kocovski, (2017) and Butz and Stahlbeg (2018) completed the SCS only at baseline, although the latter included an idiosyncratic 13 item Likert measure as a manipulation check of the intervention. One study did not include a measure of self-compassion at any point during the study, but delivered an intervention with a sole focus on developing self-compassion (Hofmann et al., 2015). The remaining studies incorporated either the SCS or SCS-SF at baseline, post intervention and if applicable, follow up. Self-compassion scores were reported in full in all articles, aside from Jazaieri et al. (2014) who referred to a separate article (Jazaieri et al., 2012) where the SCS scores were able to be extracted.

Rumination was the most widely explored outcome, with 11 studies using a version of either the Rumination Response Scale, the Responses Style Questionnaire, the Rumination Reflection Questionnaire, or an idiosyncratic state measure (Butz & Stahlberg, 2018; Finley-Jones et al., 2018; Frostadottir & Dorjee, 2019; Graser et al., 2016; Hoffmann et al., 2015; Johnson & O'Brien, 2013; Kirkpatrick, 2005; Mosewich et al., 2013; Polizzi et al., 2019; Smeets et al., 2014; Talbot et al., 2016). Four studies measured worry with a version of the Penn State Worry Questionnaire (Jazaieri et al., 2014; Polizzi et al., 2019; Schuling et al., 2018; Smeets et al., 2014). Three studies explored components of RNT often displayed in social anxiety, including post event processing (Blackie & Kocovski, 2018b; Thomas, 2010) and anticipatory anxiety (Harwood & Kocovski, 2017). Finally, two studies used the Habit Index of Negative Thinking, which attempts to transdiagnostically capture the construct of RNT (Dundas et al., 2017; Rose et al., 2018). Each of these measures have been found to generally display acceptable psychometric properties, with particular empirical support of the utility of the PSWQ and RRS within both clinical and subclinical populations (Brown et al., 1992; Erdur-Baker & Bugay, 2010; Roelofs et al., 2006; Schoofs et al., 2010; Stober, 1998).

Key methodological information from each study, alongside the quantitative findings relevant to the present research topic are outlined in Table 3.

Table 3.
Summary of studies exploring compassion interventions on repetitive negative thinking.

Author & Date	N	Design	Self-Compassion Intervention	Control/Comparator	Sample	Duration	Relevant Measures	Relevant findings
Blackie & Kocovski (2018b)	98	RCT	Compassionate writing task based on Leary et al. (2007), administered follow a speech task ($n = 34$).	1 x Ruminative group designed to elicit negative cognitions around participants' speech performance ($n = 33$). 1 x Control group reflectively writing in a normal manner ($n = 31$).	Undergraduate Canadian sample, pre-screened for elevated social anxiety by the SPIN and SIAS. Age: ($M = 18.65$, $SD = 1.13$). 70.41% identified as female.	Single experimental manipulation with a 24 hour follow up.	SCS-SF trait. SCS-SF state. PEPI, trait and state.	SC group reported significantly higher self-compassion than both the rumination and control groups at 24-hour follow up ($p \leq .01$; $\eta_p^2 = .14$). SC group reported significantly less state post event processing at 24-hour follow up than both rumination and control groups ($p \leq .01$; $\eta_p^2 = .11$).
Butz & Stahlberg (2018)	88	RCT	1 X Compassionate writing group describing a personal problem, prompted to consider compassionate qualities as defined by Neff (2003). 1 x 20-minute guided LKM audio practice following thinking about a personal problem for three minutes.	Control group asked to think about a personal problem for three minutes as they would normally (without a compassionate reframe).	German undergraduates who had not previously participated in a study into SC or sleep quality. 55% identified as male Age: ($M = 22.59$, $SD = 3.43$).	Single experimental manipulation completed in the evening. Sleep quality and rumination measured the following morning.	SCS as a baseline comparator. 13 Likert style state SC adjectives as a manipulation check following condition. RRS: brooding and reflection subcomponents. SQI.	Both SC groups reported significantly higher agreement with SC adjectives following condition than control group ($p < .01$, $d = 0.59$). Both SC groups had significantly better quality of sleep ($p < .05$, $d = 0.46$), but no differences between SC interventions. Significant indirect effect of self-compassion on general sleep quality through rumination ($p < .05$, $b = 0.27$).

Table 3 continued.

Author & Date	<i>N</i>	Design	Self-Compassion Intervention	Control/Comparator	Sample	Duration	Relevant Measures	Relevant findings
Finlay-Jones et al. (2018)	49	Quasi-experimental.	8-week MSC group based upon Neff and Germer's (2013) programme. Included weekly 2.5hr sessions in addition to a half day silent retreat between weeks 4 and 5.	No comparator group.	Chinese convenience community sample. 100% identified as female. Age: ($M = 36.6$, $SD = 7.1$). 68.2% reported previous experience in mindfulness, 20% previously completed a mindfulness-based programme in the past.	Pre-post intervention measures, 3 months follow up.	SCS. FCS – self subscale RRS Scales translated from English to Chinese by author, but not validated in adapted form.	Main effect of time on self-compassion, with a significant increase found through to follow up ($p < .001$, $d = 2.76$). Fear of self-compassion significantly reduced at follow up ($p < .001$, $d = 1.55$) Rumination significantly reduced at follow up ($p < .001$, $d = 1.12$)
Dundas et al. (2017)	158	RCT.	Three 90-minute SC group sessions based upon MSC, CFT and MBSR, in addition to 15-minute guided LKM, MSC and MBSR daily practices.	Waitlist control group.	Norwegian undergraduate subclinical sample with no specified eligibility criteria. 85% identified as female. Age: ($M = 25$, $SD = 4.9$).	Two-week intervention, six months follow up.	HINT SCS-SF	SC group significantly increased in state SC compared to control ($p < .001$, $d = .94$). SC group experienced a significant reduction in negative thinking ($p < .001$, $d = .67$) post intervention. Frequency of negative thinking did not significantly change from post intervention to 6 months follow up. Comparable findings found in intention to treat analysis

Table 3 continued.

Author & Date	N	Design	Self-Compassion Intervention	Control/Comparator	Sample	Duration	Relevant Measures	Relevant findings
Frostadottir & Dorjee (2019)	58	Quasi-experimental	CFT group based upon protocol outlined by Gilbert (2009) including 8 sessions, each lasting 2 hours across a period of 4 weeks. Content included guided compassion, mindfulness, imagery and experiential practices, homework and psychoeducation of the three systems.	Waitlist control group. MBCT group following the protocol developed by Seagal (2002), modified for a 4-week duration. Consisted of 8, two-hour sessions and included a range of guided mindfulness practices. No explicit discussion or practice around developing SC.	Icelandic convenience sample of participants reporting mild to moderate anxiety, depression or stress within a residential rehabilitation setting. Age: ($M = 51, SD = 10.17$) 87.66% identified as female.	Four-week intervention, pre-post measure directly before and following intervention. 1 month follow up.	SCS RRQ	Paired sample t tests indicated CFT group reported significant increases in SC following intervention CFT ($p < .05, d = -.39$). Significant reductions in rumination following intervention in both CFT ($p < .003, d = .67$) and MBCT groups MBCT ($p < .002, d = .87$). No significant differences for either group between post intervention and follow up.
Graser et al. (2016)	11	Quasi-experimental	12 weekly group sessions, each lasting 100 minutes. Homework of 30 minutes per day 6 times a week. Initial focus on MBCT approaches (e.g. body scan, sitting meditation), before CFT based introduction to the emotion regulation model, soothing rhythm breathing and compassionate color meditation. Sessions 9-12 comprised of LKM based exercises.	Within subject waitlist control.	Community sample of German participants diagnosed with dysthymia, double or recurrent depression. Excluded on the basis of substance abuse, acute manic or psychotic symptoms, PTSD, OCD, eating disorders, personality disorders, acute suicidality or severe neurological conditions. Age: ($M = 46.46, SD = 9.75$) 64% identified as male.	Baseline measures initially recorded followed by a 3-month waitlist control period. Repeat of measures following completion of intervention and at 3-month follow up.	SCS - German version RSQ - German version	No significant changes over time for the SCS ($p = .29, \eta_p^2 = .29$) No main effect of time on rumination ($p = .10, \eta_p^2 = .23$). Post-hoc tests on individual RSQ subscales found a significant difference when comparing RSQ-self at baseline and follow up ($p = .015, d = .46$). No significant differences were found in RSQ-symptoms or Distraction subscales.

Table 3 continued.

Author & Date	N	Design	Self-Compassion Intervention	Control/Comparator	Sample	Duration	Relevant Measures	Relevant findings
Harwood & Kocovski (2017)	118	RCT	Self-compassionate writing task adapted from Leary et al. (2007) to make specific to previous negative work-related experiences prior to a speech task.	Control groups tasked to write about a negative work-related experience in a descriptive manner with no compassion related prompts prior to a speech task.	Canadian psychology undergraduate sample receiving course credit for participation. Participants distributed into either high or low socially anxious groups via the SPIN and SIAS. Experimental and control groups within each of these subsamples. 86% identified as female. Age: ($M = 19.13$, $SD = 2.85$)	Single intervention. No follow up due to experimental design targeting anticipatory processing.	SCS used as a baseline measure. Two Likert style questions of self-compassion and self-criticism used as a manipulation check following condition. ASBQ	No significant group x condition interaction on anticipatory processing ($p = .34$).
Hofmann et al. (2015; study 1)	21	Quasi-experimental.	12 weekly group LKM sessions. Session 1-2 touch present moment awareness via sitting meditation. Sessions 3-12 focusing on developing LKM, initially for a beloved one, the self and for a difficult acquaintance.	No control.	US community sample pre-screened for dysthymia via self-report and the PANAS. 62% identified as male. Age: ($M = 37.90$, $SD = 13.71$)	Pre-post measures completed, no follow up.	RRS	Significant reductions in self-reported rumination post intervention ($p = .002$, $d = 1.52$)

Table 3 continued.

Author & Date	N	Design	Self-Compassion Intervention	Control/Comparator	Sample	Duration	Relevant Measures	Relevant findings
Hofmann et al. (2015; study 2)	12	Quasi-experimental	9 weekly, 2-hour group LKM sessions conducted within a period of 8 weeks. A 4-hour retreat included following session 5. Content of sessions comparable to study 1 (as above), however adapted to also include psychoeducation and relaxation based breathing exercises in an attempt to lower attrition. Higher proportion of sensorial based mindfulness practices within early sessions.	No control.	German community sample pre-screened for current depression and associated comorbidities via the SCID-I and SCID-II. Exclusion criteria included ongoing substance abuse, past or acute mania or psychosis, PTSD, OCD, eating disorders, current suicidality, severe medical conditions and concurrent psychotherapy. 58.33% identified as female. Age: ($M = 52.08$, $SD = 10.23$)	Pre-post measures completed, no follow up.	German version of the RSQ	Significant reductions in self-reported rumination post intervention ($p = .033$, $d = .72$)
Jazaieri et al. (2014)	100	RCT	9 weekly, 2-hour sessions of group CCT alongside daily compassion-focused meditation practice. Components include psychoeducation, LKM and reflective discussion from selected poetry or inspiring stories.	Waitlist control group ($n = 40$)	US Community sample excluded on the basis of bipolar, major depressive disorder, psychosis, or active suicidal ideation.	Pre-post measures completed- no follow up.	SCS and FCS (reported in Jazaieri et al., 2012) PSWQ	Fear of self-compassion significantly reduced post intervention ($p < .001$, $d = .34$). Self-compassion significantly increased post intervention ($p < .001$, $d = .29$). Significant interaction between group and time found for worry ($p < .002$, $\eta_p^2 = .11$). Post hoc t tests indicate the CCT group to demonstrate significantly lower worry post intervention ($p < .001$, $d = .23$). No significant pre-post differences found within control ($p = .50$)

Table 3 continued.

Author & Date	N	Design	Self-Compassion Intervention	Control/Comparator	Sample	Duration	Relevant Measures	Relevant findings
Johnson & O'Brien (2013)	90	RCT	Self-compassionate writing task based on Leary et al. (2007; $n = 45$), adapted to target previous experiences of shame.	Expressive writing group to also reflect on previous shame-based experiences with no prompts to elicit SC ($n = 43$) Additional no writing control group.	Canadian university student sample scoring at or above median on the TOSCA based from a previous correlational study. Age: ($M = 19.12$) 81.65% identified as female.	3 writing exercises completed within a week period. Two weeks follow up.	RRQ SCS	When inputting trait SC and self-esteem as a covariate, self-compassion was significantly higher in the compassionate writing compared to control condition post-intervention ($p = .049$). The SC group reported lower levels of rumination post intervention, although these findings were non-significant ($p = .094$, $d = .32$)
Kirkpatrick (2005)	80	RCT	Singular gestalt based two-chair intervention designed to split and then allow expression from two conflicting aspects of the self (critical-criticized) to allow acceptance.	Measures only control	US university student sample completing educational psychology courses. 93.34% identified as female Age: Female ($M = 20.89$, $SD = 1.19$), Male ($M = 20.60$, $SD = 1.14$)	Baseline, three days post intervention and at follow up 2 ½ weeks later.	SCS RRS	The time x condition interaction was not significant for SC post intervention ($p = .91$). No significant time x condition interaction was found post intervention for rumination ($p = .12$).

Table 3 continued.

Author & Date	N	Design	Self-Compassion Intervention	Control/Comparator	Sample	Duration	Relevant Measures	Relevant findings
Mosewich et al. (2013)	60	RCT	1 group SC psychoeducational session coupled and practice writing exercise followed by 7-day protocol of compassionate writing tasks adapted by Leary et al. (2007; $n = 31$)	Attention control group, similar in structure but differing in content to experimental group ($n = 29$)	Canadian university sample of athletes who identified as “highly self-critical” 100% female sample Age: Intervention ($M = 20.28$, $SD = 2.25$), Control ($M = 20.27$, $SD = 1.08$).	Baseline and post measures (completed 1 week after intervention). Final follow up 1 month later.	SCS State rumination measured using three questions adapted from Puterman, DeLongis, and Pomaki (2010) to reflect difficulties experienced during sport.	Significant increase of SC in experimental compared to control post intervention ($p < .01$, $d = .79$) and at one month follow up ($p < .01$, $d = .82$) Significant decrease of rumination in experimental compared to control post intervention ($p < .05$, $d = -.66$) and at one month follow up ($p < .01$, $d = -1.16$)
Polizzi, Baltman & Lynn (2019)	131	RCT	2-week LKM programme adapted from Salzberg (1995) with three experimental arms: extending compassion towards both the self and others ($n = 37$), extending compassion towards the self alone ($n = 30$), or extending compassion towards others alone ($n = 32$). Daily audio guided practice in the week between sessions.	Sitting quietly control group ($n = 32$)	US undergraduate sample participating for course credit. 57.3% female sample. Age: ($M = 18.96$, $SD = 1.00$)	Pre-post intervention measures collected alongside a one week follow up.	SCS RRS PSWQ	The multivariate main effects analysis found a nonsignificant interaction between time and condition. No significant differences found between conditions in self compassion, rumination or worry (All $ps \geq .11$).

Table 3 continued.

Author & Date	N	Design	Self-Compassion Intervention	Comparator	Sample	Duration	Relevant Measures	Relevant findings
Rose et al. (2018)	23	Quasi-experimental	Six one-hour individual sessions using methods from CFT alongside a two month follow up.	No control	UK university sample reporting high levels of self-criticism resulting in functional impairment as identified on the WSAS. Excluded if currently receiving psychotherapy, or diagnosed with psychosis, anorexia or substance dependence via the M.I.N.I. Age: ($M = 25.3$, $SD = 6.16$). 82.61% identified as female.	Measures collected at each session, post intervention and at two months follow up.	HINT SCRS SCS	Significant increase in SC from pre-post intervention ($p < .001$, $d = 1.67$) and follow up ($p < .001$, $d = 1.97$) Significant reduction in habitual negative thinking from pre-post intervention ($p < .001$, $d = -.77$) and follow up ($p < .001$, $d = -1.37$) Significant reduction in self-critical rumination from pre-post intervention ($p < .001$, $d = -1.60$) and follow up ($p < .001$, $d = -2.22$)
Schuling et al. (2018)	17	Quasi-experimental	8 2.5hr group MBCL sessions. Structure similar to that of MBCT but primary focus of developing compassion; incorporating elements of both MSC and CFT. Two groups assessed, 10 participants who had completed group one were re-enrolled into group two. Audio-based home practice recommended between sessions.	No control	Dutch community sample reporting recurrent depression recruited from a mindfulness centre. Depressive diagnosis and comorbidity assessed via the M.I.N.I. Participants excluded on the basis of past manic or psychotic episodes and substance abuse within the last year. 87% of sample identified as female. Age: ($M = 53.4$, $SD = 9.3$).	Pre-post intervention measures completed, no follow up.	PSWQ – Dutch version (Meyer et al, 1990). SCS – Dutch version	Significant increase reported in SC (group 1: $p = .043$, $d = .56$; group 2: $p = .045$, $d = .37$). Particular improvements in the subdomains of self-kindness ($d = .53$), overidentification ($d = .93$) and isolation ($d = .57$). No significant pre-post differences found in levels of worry (group 1: $p = .359$, $d = .23$; group 2: $p = .411$, $d = .29$).

Table 3 continued.

Author & Date	N	Design	Self-Compassion Intervention	Control/Comparator	Sample	Duration	Relevant Measures	Relevant findings
Smeets et al. (2014)	52	RCT	SC group intervention. 3 weekly sessions each lasting between 45-90 minutes ($n = 27$). Intervention incorporating elements of MSC, LKM, compassionate letter writing and psychoeducation.	Active: time management group delivered in a comparable format to intervention ($n = 25$)	Dutch college sample in receipt of course credit or gift vouchers for completion of the study. 100% of sample identified as female. Age: ($M = 19.96$, $SD = 1.33$).	Pre-post measures completed in the weeks before and after intervention.	SCS – Dutch version RRS-NL-EXT Abbreviated 11 item version of the PSWQ – Dutch version	Significant improvements in SC within experimental group compared to control ($p < .01$, $d = 1.19$) Significant reduction in rumination in experimental group compared to control ($p < .05$, $d = .70$) No significant difference found in worry ($p > .05$, $d = .19$)
Talbot et al. (2016)	9	Single case AB experimental design.	Seven self-compassionate exercises obtained from the open access psycho-educational self-compassion website (Neff, 2016). Exercises include guided meditation, compassionate writing, self-compassion journals, and identifying the compassionate observer in response to the critical self.	No control	Canadian university students and staff members reporting a ‘tendency to be hard on oneself’. 78.6% identified as female. Age: ($M = 31.8$, $SD = 11.5$).	4-week baseline wait control period followed by a 5-week intervention period. Outcome measures obtained on a weekly basis throughout intervention.	SCS RRQ – self rumination subscale	7 of the 8 intervention completers reported a significant increase in SC post intervention ($p < .05$, $CD = 1.30 - 1.37$) 2 out of 8 intervention completers reported a significant reduction in rumination ($p < .05$, $CD = 2.20$).

Table 3 continued.

Author & Date	N	Design	Self-Compassion Intervention	Control/Comparator	Sample	Duration	Relevant Measures	Relevant findings
Thomas (2010)	63	RCT	Single compassionate writing exercise based upon Leary et al. (2007), adapted to make relevant following a speech exercise (n = 21).	Emotional processing writing group (n = 21) Control writing group (n = 21)	UK university students and staff members pre-screen to experience elevated levels of social anxiety via the SIAS. Course credit or monetary payment following completion of the study. 63.49% of sample identified as female. SC group age: (M = 23.9, SD = 10.3). Emotional processing group age: (M = 22.23, SD = 7.23). Control group age: (M = 21.66, SD = 3.98).	Baseline, post-intervention and two days follow up in order to measure subsequent post event processing.	SCS completed as a baseline measure only TQ: modified by Dannahy and Stopa (2007) to be reflective of post event processing. DTQ: developed by Dannahy and Stopa (2007)	No significant differences between groups in post event processing immediately following speech exercise (p = .24) Effect of time (p < .001), but not of group (p = .43) in post event processing in the two days following the speech.

Note: SC = Self-Compassion, RCT = Randomised Controlled Trial, SPIN = Social Phobia Inventory (2000), SIAS = Social Interaction Anxiety Scale (1992), SCS-SF = Self-Compassion Scale Short Form (2011), PEPI = Post Event Processing Inventory (2017), LKM = loving kindness meditation, SCS = Self-Compassion Scale (2003), RRS = Ruminative Response Scale (2003), MDD = major depressive disorder, SQI = Sleep Quality Index (1998), MSC = Mindful Self-Compassion, FCS = Fear of Compassion Scale (2017), CCT = Compassion Cultivation Training, CFT = Compassion Focused Therapy, MBSR = Mindfulness Based Stress Reduction, HINT = Habit Index of Negative Thinking (2007), MBCT = Mindfulness Based Cognitive Therapy, RRQ = Rumination-Reflection Questionnaire (1999), PTSD = Post-Traumatic Stress Disorder, OCD = Obsessive Compulsive Disorder, RSQ = Response Styles Questionnaire (1991), ASBQ = Anticipatory Social Behaviours Questionnaire (2003), PANAS = Positive and Negative Affect Scale (1988), SCID = Structured Clinical Interview for DSM-IV Disorders, PSWQ = Penn State Worry Questionnaire (2009), TOSCA = Test of Self-Conscious Affect (2000), SCRS = Self-Critical Rumination Scale (2013), M.I.N.I = Mini International Neuropsychiatric Interview, RRS-NL-EXT = Ruminative Response Scale - Netherlands – Extended (2003), TQ = Thoughts Questionnaire (2003), DTQ = Daily Thoughts Questionnaire (2007)

1.3.2 Quality Assessment

The finalised quality ratings agreed between researchers are summarised in Table 4. No studies were excluded on the basis of methodological limitations. Generally, all articles included in the review were clear in their aims, hypotheses and study procedures. Additionally, all conducted measurement of baseline characteristics and reported general participant demographic information; those who used a comparator group in their design also explored the potential for differences in this data. All pre-specified study outcomes were reported in full, although no studies reported registering study protocols prior to the commencement of their research. A range of methodological limitations were also shared across the majority of studies. Only one study tried to control for performance and detection bias by incorporating an element of blinding (Dundas et al., 2017). Selection bias and generalisability was also commonly impacted upon by homogenous, self-selecting samples, with student samples also often in receipt of payment or credit for participation. In regards to statistical analysis, generally, all studies were appropriate in their statistical methods, utilising either *t* tests, univariate or multivariate analysis of variance. However, although many studies incorporated a large number of dependent variables, few employed a multivariate analytical strategy or made alternative attempts to control for type one error (Nayak, 2010). Also, many did not incorporate an intention to treat principle to account for participant attrition. Finally, of the 11 RCT's, only four stated their methods of randomisation (Dundas et al., 2017; Jazaieri et al., 2014; Mosewich et al., 2013; Smeets et al., 2014), although the majority of studies attempted to control for significant differences between groups at pre-intervention in their analysis. Table 4 provides a full overview of each of the study's individual quality rating scores.

Table 4.
Summary of study quality.

Non-randomised studies				
	Finlay-Jones et al. (2018)	Frostadottir & Dorjee (2019)	Graser et al. (2016)	Hofmann et al. (2015)
Criteria				
<i>Question and hypotheses described</i>	Yes	Yes	Yes	Yes
<i>Design appropriate</i>	Yes	Yes	Yes	Yes
<i>Selection methods described</i>	Yes	Yes	Yes	Yes
<i>Participant characteristics detailed</i>	Yes	Yes	Yes	Yes
<i>Randomisation method stated</i>	N.A	N.A	N.A	N.A
<i>Investigator /subject blinding</i>	N.A	No/ N.A	N.A/ N.A	N.A/ N.A
<i>Robust outcomes used</i>	Partial	Partial	Yes	Yes
<i>Sample size appropriate</i>	Yes	Yes	Partial	Partial
<i>Analysis detailed and appropriate</i>	Yes	Partial	Partial	Partial
<i>Estimate of variance included</i>	Yes	Yes	Yes	Partial
<i>Confounding controlled</i>	No	No	No	No
<i>Results reported in detail</i>	Yes	Yes	Yes	Yes
<i>Appropriate conclusions made</i>	Yes	Yes	Yes	Yes
<i>Total Score</i>	19/22	18/24	18/22	17/22
<i>Summary Score</i>	.86	.75	.81	.77
<i>Areas of poor quality</i>	No control group. Homogenous female sample. Translated scales unvalidated in subject population.	Non-randomised. convenience sample with access to additional therapeutic support. Regular supervision but no formal fidelity assessment. CFT not manualised like MBCT arm. Translated scales not validated in population. No control for type one error.	Small uncontrolled sample size with large attrition prior to group commencing. No control for multivariate analysis with post hoc's conducted following no significant main effect, increasing likelihood for type one error	Small sample size with high attrition, no control for multivariate analysis and no comparator group. Type 1 error not accounted for within multiple <i>t</i> tests. Confidence intervals not reported.

Table 4 continued.

Non-randomised studies			
Criteria	Rose et al. (2018)	Schuling et al. (2018)	Talbot et al. (2016)
<i>Question and hypotheses described</i>	Yes	Yes	Yes
<i>Design appropriate</i>	Yes	Yes	Yes
<i>Selection methods described</i>	Yes	Yes	Yes
<i>Participant characteristics detailed</i>	Yes	Yes	Yes
<i>Randomisation method stated</i>	N.A	N.A	N.A
<i>Investigator /subject blinding</i>	N.A/ N.A	N.A/ N.A	N.A/ N.A
<i>Robust outcomes used</i>	Yes	Yes	Yes
<i>Sample size appropriate</i>	Yes	Partial	Partial
<i>Analysis detailed and appropriate</i>	Yes	Yes	Yes
<i>Estimate of variance included</i>	Yes	Yes	Yes
<i>Confounding controlled</i>	No	No	No
<i>Results reported in detail</i>	Yes	Yes	Yes
<i>Appropriate conclusions made</i>	Yes	Yes	Yes
<i>Total Score</i>	20/22	19/22	18/22
<i>Summary Score</i>	.91	.86	.82
<i>Areas of poor quality</i>	Uncontrolled design. Homogenous sample.	Uncontrolled design, unable to determine if appropriately powered. Self-selecting homogenous sample with a large component repeating the intervention at the second group.	High attrition prior to intervention.

Table 4 continued.

Randomised studies.					
Criteria	Blackie & Kocovski (2018b)	Butz & Stahlberg (2018)	Dundas et al. (2017)	Harwood & Kocovski (2017)	Jazaieri et al. (2014)
<i>Question and hypotheses described</i>	Yes	Partial	Yes	Yes	Yes
<i>Design appropriate</i>	Yes	Yes	Yes	Yes	Yes
<i>Selection methods described</i>	Yes	Partial	Yes	Yes	Yes
<i>Participant characteristics detailed</i>	Yes	Yes	Yes	Yes	Yes
<i>Randomisation method stated</i>	Partial	Partial	Yes	Partial	Yes
<i>Investigator /subject blinding</i>	No/ N.A	No/ N.A	No/ Partial	No/ N.A	No/ N.A
<i>Robust outcomes used</i>	Yes	Yes	Yes	Yes	Yes
<i>Sample size appropriate</i>	Yes	Yes	Yes	Yes	Yes
<i>Analysis detailed and appropriate</i>	Yes	Yes	Partial	Yes	Yes
<i>Estimate of variance included</i>	Yes	Yes	Yes	Partial	Yes
<i>Confounding controlled</i>	Partial	Partial	Partial	Yes	Yes
<i>Results reported in detail</i>	Yes	Yes	Yes	Partial	Yes
<i>Appropriate conclusions made</i>	Yes	Yes	Yes	Yes	Yes
<i>Total Score</i>	22/28	20/28	23/28	21/28	24/28
<i>Summary Score</i>	.79	.71	.82	.75	.86
<i>Areas of poor quality</i>	Some attrition and SIAS not reassessed at baseline. Unclear if student sample were in receipt of payment/course credit. Randomisation method not specified	High level of attrition (33%) not accounted for in analysis. Randomisation method not detailed. Recruitment method not sufficiently described.	No multivariate analysis. Baseline differences in self-efficacy not controlled. Homogeneous, self-selecting sample. High attrition (26% BL to PI, 46% BL to FU); however, ITT analysis performed.	No multivariate analysis. Effect sizes not reported. Randomisation method not stated. Homogenous student sample.	Blinding may have been possible if additional investigators utilised during the intervention period.

Table 4 continued.

Randomised studies.						
Criteria	Johnson & O'Brien (2013)	Kirkpatrick (2005)	Mosewich et al. (2013)	Polizzi et al. (2019)	Smeets et al. (2014)	Thomas (2010)
<i>Question and hypotheses described</i>	Yes	Partial	Yes	Yes	Yes	Yes
<i>Design appropriate</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Selection methods described</i>	Yes	Partial	Yes	Yes	Yes	Yes
<i>Participant characteristics detailed</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Randomisation method stated</i>	Partial	Partial	Yes	Partial	Yes	Partial
<i>Investigator /subject blinding</i>	No/ N.A	No/ Yes	No/ N.A	No/ N.A	Partial/ N.A	No/ N.A
<i>Robust outcomes used</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Sample size appropriate</i>	Yes	Yes	Yes	Yes	Yes	Partial
<i>Analysis detailed and appropriate</i>	Partial	Partial	Yes	Yes	Yes	Yes
<i>Estimate of variance included</i>	Yes	Partial	Partial	Partial	Partial	Yes
<i>Confounding controlled</i>	Yes	Yes	Yes	Yes	Yes	Partial
<i>Results reported in detail</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Appropriate conclusions made</i>	Yes	Partial	Yes	Yes	Yes	Partial
<i>Total Score</i>	22/28	19/28	23/28	22/28	24/28	20/28
<i>Summary Score</i>	.79	.68	.82	.79	.86	.71
<i>Areas of poor quality</i>	Homogenous student sample, predominantly female, high attrition. Covariates used but no multivariate control. Randomisation method not stated.	Recruitment and randomisation not detailed. No control for type one error. Homogenous sample. Speculative conclusions made with non-significant findings.	Multivariate statistical model employed; although attrition not controlled. Fidelity not independently assessed (although manualised).	Homogenous sample. Randomisation method not stated. Blinding not reported,	Unclear if investigators responsible for analysis blind to condition. Homogenous female psychology undergraduate sample in receipt of credit.	Low power. Self-compassion not measured as a manipulation check. Randomisation not stated. Speculative conclusions given methodological limitations.

Taken together, there was a risk of bias in all studies included in this review. With this in mind, the study findings are holistically synthesised in relation to their methodological design and aspect of RNT investigated, with similarities and differences in outcomes critically appraised.

1.3.3 Quasi-Experimental Designs

1.3.3.1 Quasi-Experiments Including a Measure of Rumination

Of the six studies which implemented a quasi-experimental design, four explored rumination through group interventions (Graser et al., 2016; Hofman et al., 2015; Finlay-Jones et al., 2018; Frostadottir & Dorjee, 2019). All found significant reductions to ruminative thinking post-intervention, either within individual subscales (Graser et al., 2016) or as total scale scores. As each of these studies used a different therapeutic intervention to foster self-compassion, from LKM (Hofmann et al., 2015), MSC (Finlay-Jones et al., 2018), CFT (Frostadottir & Dorjee, 2019), to an intervention combining elements of MBCT, LKM and CFT (Graser et al., 2016) these findings give initial indication that each modality may be comparable in effectiveness. These studies were also conducted across a range of samples, including clinical (Graser et al., 2016; Frostadottir & Dorjee, 2019; Hofmann et al., 2015) and non-clinical populations (Finlay-Jones et al., 2018). These were predominantly within European settings, however, as Finlay-Jones and colleagues conducted their study within a Chinese sample, this provides tentative evidence of the transferability of compassion-based approaches cross-culturally (Polit & Beck, 2010). However, this is limited by the fact that all participants in this study were female, and 68.2% reported previous experience of meditative practice.

In addition, each of these studies had notable limitations. Namely, Finlay-Jones et al. (2018) and Hofmann et al. (2015) did not incorporate a control group, whereas Frostadottir and Dorjee (2019) conducted their study within a residential setting where participants had access to additional therapeutic support such as massage, acupuncture and general

psychoeducation. Therefore, it is unclear if co-occurring variables may have affected outcomes within these studies. However, Frostadottir and Dorjee did incorporate a wait-list control group, which also were able to access additional therapeutic support. As this group reported no significant improvements in self-compassion or rumination, it can be cautiously concluded that self-compassion may have been the active component within this study.

In the case of Graser et al. (2016) and Hofmann et al. (2015), there was less evidence to support self-compassion as the active component within the intervention. For example, although finding small improvements within self-focused rumination, Graser et al. (2016) found no significant improvements in self-compassion post-intervention. When exploring this, Graser and colleagues reflected from anecdotal feedback that turning towards personal suffering in a compassionate manner adversely triggered an increase in negative affect and self-criticism for some participants; a factor noted as a potential barrier in the work of CFT (Gilbert et al., 2011). Unlike Finlay-Jones et al. (2018) and Frostadottir and Dorjee's (2019) studies, Graser and colleagues' sample were clinically diagnosed with persistent depression, of an average length of 11.55 years. These findings may therefore reflect the additional complexities of implementing relatively brief group compassion-based interventions with a clinical sample experiencing longstanding mental health difficulties (Gilbert & Proctor, 2006). Considering the small improvements in the RSQ-self subscale within this study, it is possible these findings may also be due to the added inclusion of an initial three sessions of general mindfulness, a practice evidenced to reduce RNT (Van der Velden et al., 2015). However, these conclusions are highly constrained by a lack of multivariate control and an underpowered sample, which each significantly increases the likelihood of type I and II error respectively (Nayak, 2010).

Graser et al.'s (2016) outcomes also show variation to those of Hofmann et al. (2015), who effectively reduced rumination to a significantly greater extent within a comparable clinical sample of German participants. In contrast to Graser et al., Hofmann

and colleagues solely conducted a LKM intervention, rather than combining elements of general mindfulness, MSC and CFT. Although it includes a meditative component, LKM places explicit emphasis on building compassion for the self and others (Hofmann, 2011). This may indicate that self-compassion was the active component of the larger improvements in rumination within this study; however, neither a measure of self-compassion or mindfulness was incorporated into the study design, meaning this consideration cannot be effectively determined. There was also a higher rate of attrition (33%) within Hofmann and colleagues' study, not accounted for in their analysis, which may have overinflated the improvements found in rumination (Dumville et al., 2006).

1.3.3.2 Quasi-Experiments Including a Measure of Worry

A final group intervention employing a quasi-experimental design was conducted by Schuling et al. (2018), who explored the impact of self-compassion on worry within a clinical sample reporting recurrent depression. This intervention adopted a 'Mindfulness Based Compassionate Living' protocol, which is a format akin to MSC but incorporating additional elements of CFT. Alongside psychoeducation of the tripartite regulation systems (Gilbert, 2009), the CFT component aimed to normalise the challenges of developing self-compassion to minimise iatrogenic responses, such as reported by Graser et al. (2016). However, no significant reductions in worry were reported post-intervention. As the intervention was delivered in a comparable format to Frostadottir and Dorjee (2019), with both studies reporting similar improvements in self-compassion, this may give initial evidence that rumination and worry differ in responsiveness to compassion-based interventions. However, it is of note that as an initial feasibility study, the sample recruited were purposefully selected as frequent attendees of a mindfulness centre, and had all previously completed a course of MBCT in recent weeks. As mindfulness has been indicated to lead to reductions in worry frequency, and possibly less identification with worry content (Van der Velden et al., 2015), it is possible that this factor may have dampened the potential gains of self-compassion.

1.3.3.3 Quasi-Experiments Including a Transdiagnostic Measure of RNT

The final quasi-experimental study included differed from the previous designs in that it used one-to-one sessions of CFT and the Habit Index of Negative Thinking; a transdiagnostic measure of RNT. Within an undergraduate sample reporting self-criticism to a level of functional impairment, Rose et al. (2018) found significant improvements in both self-compassion and RNT post-intervention, with further improvements in each of these domains reported at three months follow up. These improvements were greater than those reported within a group CFT approach (Frostadottir & Dorjee, 2019). When considering that participants were offered six, one-hour sessions as opposed to eight, two-hour group sessions, this indicates that individual approaches may be a more efficient method of intervention for clients. Within an individual format CFT has the added potential for flexible, person-centred delivery based upon the specific presenting problems and case formulation of each participant, whereas group interventions typically are required to follow a manualised session content applicable to all attendees (Kirby, 2017). This possibly meant that participants were better able to contextualise the benefits of self-compassion, and may also explain how several participants showed greater improvements across outcomes at follow-up. However, similar to Finlay-Jones et al. (2018), as an uncontrolled study consisting of predominantly white, self-selecting females, the external validity of these findings are constrained.

1.3.3.4 Summary of Quasi-Experimental Studies

Overall, these findings suggest preliminary evidence for the positive impact of self-compassion across transdiagnostic and ruminative domains of RNT, with less compelling support of the effect of self-compassion on reducing worry. As several studies were pragmatically conducted within clinical populations (Frostadottir & Dorjee., 2019; Hofmann et al., 2015; Schuling et al., 2018) there is tentative support for the clinical applicability of group compassion-based interventions; although there is also preliminary evidence which may indicate individual approaches may be more efficacious (Rose et al.,

2018). However, such conclusions are made cautiously due to the majority of studies comprising of uncontrolled designs, and those that utilised comparator groups or a waitlist control period (Frostadottir & Dorjee, 2019; Graser et al., 2016) did so without the benefits of randomisation; increasing the risk of allocation bias. Additionally, not all studies conducted effective manipulation checks to determine if self-compassion did indeed improve post-intervention (Hoffmann et al., 2015). Therefore, it is important to appraise this group of quasi-experimental studies in relation to the randomised controlled studies included within the current review.

1.3.4 Randomised Controlled Designs

1.3.4.1 Randomised Studies Exclusively Measuring Rumination

Of the 11 RCT's included, four explored the effect of developing self-compassion upon rumination without measurement of additional subdomains of RNT. Mosewich et al. (2013) used a compassionate writing exercise over a one-week period adapted from Leary et al. (2007), where participants were asked to write compassionately about past experiences where they felt self-critical. Compared to a control group, significant improvements in self-compassion and reductions in rumination of a medium magnitude were found post-intervention. Compassionate writing was also used by Johnson and O'Brien (2013), again with an undergraduate analogue sample, but in contrast to Mosewich et al. (2013) there were no significant reductions in rumination compared to a non-active control group. In considering these variations in findings, Mosewich and colleagues conducted a preliminary psychoeducation and practice writing session with participants, and built upon the writing intervention in a graded manner to slowly introduce each of the elements of self-compassion as conceptualised by Neff (2003a). In contrast, Johnson and O'Brien (2013), did not provide an introductory session, had fewer sessions during the intervention period and did not grade the writing exercise. This may indicate that the added learning component and paced delivery of Mosewich et al.'s design served

to overcome any fears, blocks or confusion around reflecting on a past negative experience compassionately. However, as participants' compassionate letters were not scrutinised in either study, it is unclear whether these variations resulted in participants writing in a more compassionate style. Additionally, Johnson & O'Brien asked participants to recall an experience that occurred within the last five years where they felt ashamed, completely awful or worthless, compared to Mosewich et al. who asked participants to identify a critical sporting experience within the previous year. These differences may have resulted in participants within Mosewich and colleagues' study selecting experiences of a lower emotional valence, which may have been more conducive to therapeutic change.

In contrast to the aforementioned, two RCT's used a single compassion-based intervention in one session (Butz & Stahlberg, 2018; Kirkpatrick, 2005). In an unpublished doctoral thesis, Kirkpatrick (2005) utilised an adapted gestalt two-chair intervention. Although differing in format to the previously outlined compassionate writing interventions, this exercise also focused on developing self-compassion towards a recent negative experience, using a reflective dialogue between judgmental and criticised elements of the self. There were no significant differences in either rumination or self-compassion following this intervention technique. Kirkpatrick noted that as participants were predominantly young adult students, their age-related life experience may have made it difficult for them to connect to the concept of 'deep suffering', to then respond compassionately. However, as the sample used were demographically similar to that of Mosewich et al. (2013), who effectively increased self-compassion towards prior negative experiences, there is little evidence to support this consideration. Additionally, Kirkpatrick argued that self-compassion may have been confused with self-indulgence by some. As an initial period of psychoeducation was not incorporated into the intervention, similar to Johnson and O'Brien (2013), it is possible this may have resulted in a block to adopting a compassionate mindset. However, fidelity to the intervention was also not independently

assessed, which may have been a particularly significant factor given that one researcher was a novice to applying the experimental technique.

In contrast to Kirkpatrick (2005), Butz & Stahlberg (2018) looked to explore if improving self-compassion may result in better sleep quality, via reducing rumination. A subclinical undergraduate sample were asked to think about a recent personal problem before being randomised to either one of two self-compassion conditions; a writing exercise of similar format to Johnson & O'Brien (2013), or a guided audio-based loving kindness meditation. Each of these experimental groups were also compared to a control condition asked to reflect naturally about their problem. Each of the compassion-based groups reported significantly lower levels of rumination when compared to the control group to a comparable effect size. Such findings provide initial support for the efficacy of very brief compassion-based interventions on rumination, however, there was a high level of attrition from baseline to follow up data collection not accounted for in statistical analysis which may have increased the likelihood for type one error. Moreover, although trait levels of self-compassion were compared at baseline using the SCS, an unvalidated state measure unrelated to the SCS was developed and used by the authors, limiting the ability to effectively establish if self-compassion improved. Additionally, no baseline measure of rumination was collected, meaning that pre-existing variations in trait ruminative thinking may have been present across groups. Taken in conjunction with the findings of Kirkpatrick (2005) These limitations highlight the need for more methodologically robust studies exploring the effect of single compassion-based exercises on ruminative thinking.

1.3.4.2 Randomised Studies Including a Measure of Worry

A further two randomised trials implemented group protocols, and sought to explore their impact upon both rumination and worry within undergraduate samples. Smeets et al. (2014) developed a three-week intervention incorporating elements of LKM, compassionate writing and psychoeducation under the theoretical underpinnings of Neff

(2003a). In comparison, Polizzi et al. (2019) used only guided LKM practices across their group sessions, with no psychoeducation or techniques drawing upon personal experience. Smeets and colleagues found significant improvements in self-compassion and rumination to a medium effect size, but no significant reductions in worry; in contrast, Polizzi et al. found no significant improvements in rumination or worry, but also failed to find increases in self-compassion post-intervention. These findings give further evidence that increasing self-compassion appears the active component in reducing ruminative thinking. Similar to the findings reported within quasi-experimental designs, results of the RCTs suggest that although encapsulated under the global construct of RNT, rumination and worry appear to differ in their responsiveness to compassion-based interventions.

However, one study in the current review is an exception to this latter consideration. Following nine group sessions of Compassion Cultivation Training, Jazaieri et al. (2014) found significant reductions in worry when comparing to a waitlist control to a small effect size. In comparison to Smeets et al. (2014) and Polizzi, Baltman and Lynn (2019), rather than a student sample, participants were adults of an older age recruited from the community. This perhaps meant that they were more intrinsically motivated to engage in the intervention, rather than participating for receipt of student credit. Another notable element of Jazaieri and colleagues' study was its independent rating of treatment fidelity, a factor not considered across any other study exploring worry as an outcome measure. However, Jazaieri and colleagues incorporated a range of exclusion criteria in their design, including major depression. When considering the comorbid nature of low mood and anxiety, this may limit the external validity of these findings (Insel et al., 2010).

1.3.4.3 Randomised Studies Including a Measure of Anticipatory and Post Event Processing

Three studies in the current review explored post-event and anticipatory processing, domains of RNT conceptualised as maintaining processes in social anxiety (Clark & Wells, 1995). Two used a social stressor task to explore the impact of a single compassionate

writing exercise on post event processing (PEP) (Blackie & Kocovski, 2018b; Thomas, 2010). By comparison, Harwood & Kocovski (2017) explored the effect of compassionate writing on anticipatory processing by inducing a state of threat in participants before an upcoming speech. Of these studies, only Blackie and Kocovski (2018b) found significant reductions in the RNT subdomain of interest. In appraising these findings, the unpublished study by Thomas (2010) was constrained by low power, and did not use a measure of state self-compassion. This leaves uncertainty about whether the experimental manipulation operated as intended, although the speech exercise was similar in structure to Blackie and Kocovski (2018b) and had been adapted from the widely evidenced method developed by Leary et al. (2007). Thomas' participants also rated PEP after a two-day interval, compared to a 24-hour period in Blackie and Kocovski's design. This extended period may have led to PEP levels to naturally diminish, as post event processing had significantly reduced in both the control and experimental groups during this time.

In considering the non-significant effect of compassionate writing on anticipatory processing, Harwood and Kocovski (2017) measured this domain of RNT through an adapted version of the Anticipatory Social Behaviours Questionnaire (ASBQ; Hinrichsen & Clark 2003). Originally, the ASBQ was developed as a trait measure comprising two domains that reflect (a) global anticipatory processing, and (b) avoidance and preparation. Factor analysis of the scale led the authors to conclude that between the two, higher levels of avoidance is typically more predictive of poor functioning in socially anxious individuals (Mills et al., 2013). Considering this in relation to Harwood and Kocovski's study, it may have been that having to complete an impromptu speech increased participants' levels of cognitive preparation in a normative manner. This may have then masked any observable changes in catastrophic thinking and cognitive avoidance to the point of significance. However, as anticipatory processing is a cognitive process occurring in response to a future orientated social stressor, these findings may be comparable to the non-significant outcomes of several studies exploring worry (Polizzi et al., 2019; Schuling

et al., 2018). Taken together, this may indicate that self-compassion is less effective at buffering against RNT when the content of repetitive thinking is directed towards a future situation of perceived upcoming threat, rather than past experiences.

1.3.4.4 Randomised Studies Including a Transdiagnostic Measure of RNT

Finally, Dundas et al. (2017) evaluated the effect of a group intervention on RNT as a transdiagnostic process. Similar to Rose et al. (2018), this study used a student sample and the HINT as an outcome measure, but unlike Rose and colleagues, Dundas et al. compared findings against a waitlist control group. The results showed elevated levels of self-compassion, alongside significantly reduced RNT to a moderate effect size. These improvements were comparable, but smaller than those observed by Rose and colleagues. However, in contrast to Rose et al., participants did not continue to improve over the follow up period. As Dundas et al. utilised a brief, three session group intervention including elements of MSC, CFT and LKM, compared to the six individual sessions of CFT conducted by Rose et al.; it is unclear if either the shorter duration of the intervention or differences in content may have caused these variations in outcome. Also, Dundas and colleagues recruited a 'healthy volunteer' sample, whereas 87% of Rose and colleagues' sample had a current or previous diagnosis of an affective difficulty, and reported greater levels of RNT at baseline. This may have meant that there was more scope for responsiveness in those with higher pre-existing RNT and self-criticism. Irrespective of these variations, taken together these findings do indicate that improvements in global RNT may be observed across methodological designs and theoretical frameworks.

1.4 Discussion

This systematic review primarily aimed to explore the effectiveness of compassion-based interventions on RNT. Of the 19 compassion-based interventions included in the review, 12 demonstrated significant reductions in a domain of RNT post-intervention when compared to control groups or baseline measures (Blackie & Kocovski, 2018b; Butz &

Stahlberg, 2018; Finlay-Jones et al., 2018; Dundas et al., 2017; Frostadottir & Dorjee, 2019; Graser et al., 2016; Hofmann et al., 2015, study 1 & 2; Jazaieri et al., 2014; Mosewich et al., 2013; Rose et al., 2018; Smeets et al., 2014). Additionally, out of the seven interventions which found no significant improvements in RNT, four also failed to successfully manipulate self-compassion; meaning that these studies may not adequately explore the interplay between the two processes of interest. Taking this into consideration, when appraising only the 15 studies which successfully manipulated self-compassion (or did not conduct a manipulation check), 73% were effective in reducing a component of RNT. Of these, the majority were conducted within non-clinical or analogue samples, with two implemented within clinical settings (Frostadottir & Dorjee, 2018; Hofmann et al., 2015).

Although these findings appear promising, these must be considered relative to the likely possibility for bias and confounding present within many of the reviewed studies. Whilst comparing between each of the studies' overall summary scores may indicate the majority to be of comparable quality, this generalised approach is to be used with caution. Specifically, this method may mask differences between studies when appraising the individual components of the Quallsyst checklist (O'Conner et al., 2015). In considering each of the individual items of the Quallsyst, several notable and reoccurring methodological limitations become apparent which constrain the weight of the empirical findings. In particular, many of the studies are limited by their usage of homogenous samples, or failed to control for confounding elements by using appropriate control groups, or stating their randomisation methods. Additionally, several studies suffered from a lack of statistical power, or experienced attrition not accounted for in their analytical strategy. These issues, in conjunction with the heterogenous range of study designs, domains of RNT explored and compassion-based intervention formats necessitate that the conclusions made in the current review are to be considered as a preliminary assessment of the interplay between self-compassion and repetitive negative thinking. These findings will

now be holistically considered in the context of the theoretical underpinnings of the two constructs of interest, in order to identify both avenues for future research and clinical implications.

1.4.1 Considerations across Theoretical Modalities of Self-Compassion

1.4.1.1 The Three-Factor Model of Self-Compassion (Neff, 2003a)

In considering the interventions in relation to their underlying conceptualisation of self-compassion, the majority drew upon the three-factor model conceptualised by Neff (2003a), in an attempt to evoke self-kindness, non-judgement and mindful awareness in participants. Several of these interventions asked participants to specifically focus on past negative or shameful memories, using brief techniques such as writing (Johnson & O'Brien, 2013; Mosewich et al., 2013) or chair work (Kirkpatrick, 2005) to reframe such experiences. Although all of the brief writing interventions which incorporated a manipulation check effectively increased self-compassion in participants, the impact on rumination was variable.

Considering this variation across findings, it may be a challenge to generalise compassionate thinking around a specific past event towards more abstract, decontextualised ruminative thinking. As Watkins (2016) conceptualises rumination as a negatively reinforced, habitual avoidance behaviour, this suggests a more intensive compassionate intervention may show more transferable benefits. This is supported by the greater reductions observed in each of the group MSC interventions, which all comprised of a period of psychoeducation, mindful practice and a wider application of compassionate techniques over a longer timeframe (Finlay-Jones et al., 2018; Smeets et al., 2014). This indicates that a key mechanism of action on RNT might occur through the developing awareness of the rationale and principles of self-compassion, alongside extended practice of actively applying a compassionate mindset towards habitual thinking patterns. This is further supported by Mosewich et al. (2013), who found improved outcomes at follow up

after incorporating an initial psychoeducation and graded approach to their brief compassionate writing intervention.

Alternatively, it is possible that the compassionate writing exercises showed more variation in their response due to requiring participants to possess the sensitivity and tolerance to turn towards distressing thoughts and feelings surrounding a critical past experience (Gilbert et al., 2017). This factor is particularly relevant as all of the studies ($n = 10$) which drew upon Neff's (2003a) model were conducted within undergraduate samples, typically in receipt of student credit. Consequently, these samples may have been less intrinsically motivated to engage.

Due to this variability in single or very brief approaches, it is pertinent to consider the applicability of such techniques in the context in which RNT occurs. This is particularly relevant given the preliminary findings by Blackie and Kocovski (2018b), who demonstrated significant reductions in post event processing following a single writing intervention. As PEP is theorised to be a context-specific form of RNT, occurring following ambiguous social events (Clark & Wells, 1995), it may be effective to employ single compassion-based techniques on this process compared to depressive rumination where a longer and more systematic intervention is required. However, these conclusions are tentative due to the limited research into the effects of self-compassion on PEP, the aforementioned methodological limitations of the studies under review and the lack of research within clinical samples. Also, these findings are contrasted by those of Thomas (2010); although this study was significantly limited by a low powered sample and lack of manipulation check.

1.4.1.2 The Evolutionary Model of Self-Compassion (Gilbert, 2009)

Although only two studies used a CFT specific treatment approach in the current review (Frostadottir & Dorjee, 2019; Rose et al., 2018), they varied in both the format of their intervention and their samples, with each finding positive improvements in both self-compassion and RNT. Similar to some of the efficacious interventions adopting a three-

factor model of self-compassion (Finlay-Jones et al., 2018; Mosewich et al., 2013; Smeets et al., 2014), each CFT intervention included an initial period of socialisation and psychoeducation to the model. However, these differed by being framed within Gilbert's evolutionary model of compassion, a theory which is useful in managing fears and blocks to engaging self-compassionately (Gilbert, 2017). As ruminative thinking is conceptualised as a higher order cognitive process evolved to adaptively respond to threat (Gilbert, 2009), psychoeducation and socialisation to the model may have been a particularly useful aspect of the intervention; particularly as both CFT studies were conducted with individuals reporting elevated self-criticism or clinical symptomatology.

When compared to other therapeutic modalities, CFT also places more emphasis on stimulating affiliative processes and the parasympathetic engagement of the 'rest and digest' soothing system, through techniques such as breathing or imagery practice (Gilbert, 2009). This is due to its theoretical underpinnings incorporating additional aspects such as attachment theory and neurophysiology; elements which are typically discussed with clients during the initial psychoeducation period. It is therefore possible that CFT may additionally operate on RNT through this physiological pathway compared to interventions such as MSC, which may place more emphasis on fostering positive and flexible thinking perspectives of self-kindness and common humanity (Kirby, 2017). However, it is unclear as to how much these elements contributed to the reduced effects of RNT, as each study used the SCS, a measure of the three-factor model (Neff, 2003b). As comparable and even greater improvements were found on this measure in the CFT interventions, this indicates there may be an overlap in the mechanisms through which each therapeutic approach operates on RNT, irrespective of the model. However, as both Frostadottir and Dorjee (2019) and Rose et al.'s (2018) findings were significantly constrained by either a lack of control or randomisation, further high quality empirical investigation into the effect of CFT on RNT is warranted. This research would additionally benefit from exploring the effect of CFT specific interventions on RNT with alternative measures of self-compassion. This

may include model-specific outcome measures (Gilbert, 2017) or even physiological measures such as heart rate variability, a potentially useful indicator of affiliative emotional regulation and prosociality (Kirby et al., 2017).

1.4.2 Variations across the domains of RNT

In considering the findings across study designs, there is promising evidence for the positive effects of compassion-based interventions on depressive rumination (e.g., Frostadottir & Dorjee, 2019; Smeets et al., 2014) and general RNT (Dundas et al., 2017; Rose et al., 2018). However, the evidence is less compelling in alternative domains, such as worry, as only one study found small gains within this form of RNT (Jazaieri et al., 2014). Although there were significantly fewer studies exploring worry within the review ($n = 3$), with some having notable limitations in components of the Qualsyst (e.g., Schuling et al., 2018), it is possible these findings are attributable to the discrete variations between worry and ruminative thinking.

Although both share a number of common features, including being self-focused, negatively valenced, passive, repetitive processes related to psychopathology (Nolen-Hoeksema et al., 2008), rumination and worry typically differ in content and temporal orientation. For example, ruminative thinking is often past-orientated, consisting of themes related to self-worth, loss, sadness and a discrepancy between one's current state and idealised goals (Martin & Tesser, 1996). In contrast, worry is a typically future-orientated process in response to perceived external threat (Borkovec, 1994). Additionally, worry can function as a meta-cognitive avoidance strategy following the activation of intrusive, catastrophic imagery (Borkovec et al., 1998; Watkins, 2004), and has been associated with poor distress tolerance (Macatee et al., 2015). Considering this in the context of Gilbert's (2009) conceptualisation of self-compassion, worry may place more demand on an individuals' threat-based motivational system than rumination. Gilbert theorises this threat response to be the antithesis of the affiliative emotional regulation required for

compassionate action, which will take precedent in times of perceived threat as an evolved safety response, particularly in those with an imbalance between the three motivational systems (Gilbert, 2009). There is some evidence to support this theory, as worry can result in a higher autonomic arousal response than rumination following experimental manipulation (Aldao et al., 2013). Further research is therefore warranted to build upon the preliminary evidence into the effect of self-compassion on worry, in addition to other future orientated forms of RNT, such as anticipatory avoidance.

Furthermore, it is also important to consider that common measures of rumination and worry predominantly capture the presence or absence of each process, rather than its intensity or impact (Fresco et al., 2002; Treynor et al., 2002). Therefore, it is possible that such measures may fail to reflect whether individuals are responding more self-compassionately in the context of when they do experience RNT. As the majority of studies within the review did not use an empirically evidenced, active treatment comparator group, it is important to consider this possibility when comparing compassion-based interventions with therapeutic models such as Rumination Focussed CBT, which primarily aims to reduce the occurrence of ruminative thinking (Watkins, 2016). If such contextual benefits of self-compassion do occur when experiencing RNT, this may mean that compassion-based interventions could be a useful adjunct to complement such approaches; by helping clients respond with kindness and common humanity when they have been unable to avoid the antecedent activation of RNT. However, further analysis and exploration of the underlying mechanisms in which self-compassion may operate on RNT is required to evaluate this possibility.

1.4.3 Clinical Implications

The initial findings of the current review have several clinical implications. Firstly, the current review highlights the utility of examining processed based mechanisms of change likely to underpin psychopathological symptom reduction

(Hofmann & Hayes, 2019). This is consistent with the growing demand to adopt a broader, transdiagnostic approach towards therapeutic intervention and research, rather than taking a potentially reductionist approach when solely focussing on the development of disorder specific interventions (Insel et al., 2010). In particular, the focus on the causal effects of developing self-compassion on the reduction of RNT, rather than their general relatedness, has provided initial evidence that RNT may be amenable to change through compassion-based therapeutic techniques. This builds upon initial hypotheses of the mechanism of action of compassion-based interventions within varying forms of psychopathy (Allen & Knight, 2005; Raes, 2010). The current review also highlights that enhancing self-compassion may act upon forms of RNT within a range of demographic samples and experiences. This includes university athletes experiencing subclinical levels of self-criticism (Mosewich et al., 2013), adults reporting mild to moderate stress, anxiety or low mood (Frostadottir & Dorjee, 2019), to populations experiencing longstanding and unremitting depression (Hofmann et al., 2015). These findings support the theory that self-compassion can be a widely applicable resource to build across a range of population groups (Neff, 2007).

The demonstration of positive improvements within RNT across a range of intervention modalities and formats indicates that building self-compassion can occur across a range of therapeutic contexts. This potentially includes interventions occurring within the very time limited period of one session (Blackie & Kocovski, 2018b), one week (Mosewich et al., 2013) to a more intensive one-to-one or group intervention (Rose, McIntyre & Rimes, 2018; Frostadottir & Dorjee, 2019). Although variations in outcome across these formats were indicated which requires further investigation, this may indicate that enhancing self-compassion specifically to target RNT may be flexibly achieved depending on time, resources and one's therapeutic aims.

1.4.4 Limitations

There are several potential and recognised limitations of the current review.

Although the search strategy was conducted in a systematic manner, journal titles and abstracts may have failed to refer to secondary outcomes such as RNT; leading to studies which may have been of relevance not emerging during searches. Also, due to practical reasons, articles not written in English were unable to be reviewed. Although publication bias was minimised through searching of an unpublished research repository, this does not fully eliminate the ‘file drawer effect’, which may have constrained the dissemination of other non-significant studies (Franco et al., 2014).

As described previously, the conclusions made have been based upon studies using retrospective, self-report measures of RNT. Although being useful in reflecting participants’ personal experience, this also poses the possibility that outcomes may have been impacted upon by memory or response biases. Future research within this topic area would benefit from the integration of novel assessment methods, such as ecological momentary assessment to cross-validate self-report measures; although this may inadvertently act to exacerbate or dampen the duration or intensity of the process of RNT.

Finally, generalisation of the included studies is made difficult by the heterogeneous nature of samples, study designs, domains of RNT and format of interventions within the current review. As such, it was deemed inappropriate to use meta-analytic methods to combine and compare effect sizes, as was previously performed by Ferrari et al. (2019). However, as many of the studies included in the review used validated, comparable outcome measures of both self-compassion and RNT, narrative synthesis was considered a justifiable method to evaluate the preliminary evidence within this topic area (Snilstveit et al., 2012).

1.4.5 Avenues for Future Research

Future research is required in the form of robust, larger scale randomised controlled trials within clinical populations given the preponderance of analogue or non-clinical samples. Such clinical studies would benefit from adopting broad inclusion criteria, to accurately reflect the transdiagnostic nature of RNT (Ehring & Watkins, 2008). The use of protocol driven interventions such as MSC or CFT is recommended to ensure comparability between studies, alongside minimising the potential for extraneous factors responsible for change.

To complement clinical research, experimental research with analogue populations could further explore the potential effects of self-compassion on processes such as post-event processing and worry. This will enable a broader understanding of whether self-compassion may operate differentially on these processes. It would also be useful to explore the effects of self-compassion on forms of RNT not included within the current review, such as trauma-focused (Ehring, Frank, & Ehlers, 2008) and obsessive rumination (Rachman, 1997).

Finally, comparing not just different therapeutic modalities of compassion-based interventions, but also different compassion-based techniques would allow us to identify the active ingredients in interventions (Kirby, 2017). For example, although several studies in the current review used a brief compassionate writing intervention (Blackie & Kocovski, 2018b), it is unclear whether alternative techniques, such as compassionate imagery (Gilbert & Irons, 2004) would be similarly effective. This is particularly relevant to domains of RNT such as post event processing that has a significant negative imagery component (Clark & Wells, 1995; Dannahy & Stopa, 2007).

1.4.6 Conclusion

This systematic review is the first to synthesise the efficacy of compassion-based interventions across the full transdiagnostic construct of RNT. Furthermore, the inclusion

of a range of study designs has provided a comprehensive account of the current evidence base.

In regards to the three aims of the review; Firstly, the current review provides support of the recent meta-analysis conducted by Ferrari et al. (2019), and indicates that improving self-compassion may be an effective means of reducing depressive rumination. Secondly, there is preliminary evidence that self-compassion effectively buffers against the transdiagnostic process of RNT as conceptualised by Ehring and Watkins (2008), as well as alternative subdomains such as post event processing. However, there is currently a lack of evidence to determine the effect of self-compassion upon future-orientated RNT processes, such as worry. Finally, although the review gives initial indication that differing compassion-based therapeutic approaches may be comparably efficacious, further research is required to determine both the mechanism/s of action and optimal format of interventions. These conclusions are also to be taken cautiously in the context of the notable methodological issues highlighted in the quality appraisal of the included studies. As such, further high-quality evidence using novel and alternative methods of assessment is required to fully determine self-compassion to be the responsible mechanism of change upon RNT. Future research should also compare the effectiveness and acceptability of compassion-based interventions with alternative modalities evidenced to be effective in managing RNT, such as RF-CBT, to ascertain how compassion-based interventions may compare with, or complement such approaches.

Chapter 2 Exploring the Efficacy of both Compassionate Writing and Imagery in the management of Post Event Processing within Social Anxiety

2.1 Introduction

2.1.1 Social Anxiety Disorder

Social Anxiety Disorder (SAD) can be defined as “a persistent fear of one or more social or performance situations in which the person is exposed to unfamiliar people or to possible scrutiny by others, whereby the individual fears that he or she will act in a way (or show anxiety symptoms) that will be embarrassing and humiliating” (American Psychiatric Association, 2013, p. 202). It is one of the most common anxiety presentations, with lifetime prevalence rates based upon DSM-IV criteria ranging from 6.65-12.1% within European and US populations respectively (Fehm et al., 2005; Ruscio et al., 2008). Often a long term condition typically originating during adolescence (Fehm et al., 2005), SAD has lifetime comorbidity rates of up to 90% with a range of mental health problems, with particular risks for the subsequent development of major depression, substance misuse and suicidality (Koyuncu et al., 2019).

A leading cognitive model of social anxiety developed by Clark and Wells (1995) highlights a range of attentional and processing biases postulated as maintaining factors. These include: (a) a dominant focus on one’s own interoceptive feedback during social situations; (b) the adoption of safety behaviours; (c) an under estimation of social performance, alongside; (d) increased engagement in both anticipatory and post event processing (Clark & Wells, 1995). The present study aims to explore the second component of this fourth maintenance factor, namely post event processing (PEP). PEP has been identified as a maintaining process that requires further research into both its

relationship with the other maintenance factors and its responsiveness to psychotherapeutic intervention (Wong, 2016).

2.1.2 Post Event Processing

PEP is conceptualised as a subdomain of the transdiagnostic construct, repetitive negative thinking (Ehring & Watkins, 2008), but comprises some disorder specific features (Kocovski & Rector, 2008). PEP is a phenomenon widely delineated within cognitive models of SAD (e.g., Heimberg et al., 2010; Hofmann, 2007), and can be defined as an elevated tendency for SAD individuals to perform a perseverative, negatively valenced ‘post-mortem’ review following social interactions. For example, in comparison to depressive rumination (e.g., the dwelling on one’s depressive symptoms and their associated consequences), PEP in SAD typically occurs in response to ambiguous social situations. During PEP, elevated anxiety and a pre-existing negative self-concept leads individuals with SAD to selectively draw upon and magnify negative self-relevant aspects of the interaction. Prior memories of perceived social failure are often intrusively activated together with a focus on the present interaction. As a consequence, PEP maintains and strengthens individuals’ negative sense of self (Stopa & Clark, 2000; Wells, 1997), prevents the disconfirmation of negative beliefs, and serves to link social events in a chain of perceived failures (Clark & Wells, 1995). Research into the predictors of PEP have identified a range of contributing factors, including a negative self-performance appraisal, trait social anxiety and dysfunctional metacognitive processes (e.g., Abbott & Rapee, 2004; Dannahy & Stopa, 2007). Increased engagement in PEP also has implications for other maintaining factors of social anxiety. For instance, more engagement in PEP can increase apprehension and unwillingness to engage in future social situations, which in turn may exacerbate avoidance (Blackie & Kocovski, 2016; Rowa et al., 2016).

Findings such as these have highlighted the importance of focussing on the targeted management of PEP within psychotherapy. However, studies specifically exploring the

efficacy of interventions on PEP are limited in number and constrained by methodological issues, such as a lack of comparator groups (Abbott & Rapee, 2004; McEvoy et al., 2009) or absence of manipulation checks within experimental settings (Cassin & Rector, 2001). Nonetheless, several therapeutic modalities may potentially be of value, including Cognitive Behavioural Therapy (CBT; Price & Anderson, 2011) and Mindfulness (Cassin & Rector, 2011). Within these models, specific techniques designed to impact on PEP include cognitive reappraisal (e.g., CBT), and in the case of Mindfulness, allowing thoughts to be acknowledged and accepted in an open, non-judgmental manner (Shikatani et al., 2014). However, when exploring the role of PEP on SAD symptomatology within their study, Price and Anderson (2011) found higher levels of PEP were associated with a poorer treatment response. Although the mechanisms responsible for this are unclear, higher levels of PEP may prevent the disconfirmation of negative beliefs and maintain state anxiety between therapy sessions (Clark & Wells, 1995; Kocovski & Rector, 2008); factors which may impinge upon traditional cognitive behavioural techniques. Indeed, non-responsiveness to CBT interventions for social anxiety can be as high as 40-50%, with those who experience positive improvement often continuing to display residual symptoms (Rodebaugh et al., 2004). As such, it is pertinent to explore alternative therapeutic approaches that could enhance current evidenced based treatments. Within the field of positive psychology, one such approach gaining a degree of traction is the possible role in which the maintaining process of PEP may be buffered against through the development of self-compassion (Blackie & Kocovski, 2018a).

2.1.3 Self-Compassion and Social Anxiety

Self-compassion is a multidimensional construct with variations in conceptualisation across religious, philosophical and therapeutic contexts (Strauss et al., 2016).

Contemporary definitions drawn upon in both clinical and academic settings primarily include the work of both Kristin Neff (2003a) and Paul Gilbert (2009). Neff (2003a)

describes self-compassion as comprising of three interconnected dimensions: being understanding and warm to oneself as opposed to judgemental; holding an awareness of one's experience as common to humanity, as opposed to feeling isolated when suffering; and using mindful awareness of the transient nature of painful thoughts and feelings, rather than over identifying with them. In comparison, Gilbert's (2014a, p.19) motivational theory of self-compassion defines the construct as "The sensitivity to suffering in self and others, with a commitment to try and alleviate and prevent it". This conceptualisation draws heavily on an evolutionary and neurophysiological framework, which emphasises that self-compassion has developed from the mammalian capabilities of attachment and care provision, typically from parent to child. According to Gilbert's theory, this interplay between the giving and receiving of warmth and security leads to the maturation of a soothing, affiliative emotional regulation system, which individuals may later draw upon to direct warmth inwards to develop the 'compassionate self' (Gilbert, 2009). However, in competition with this soothing system are the adaptive, primordial drives related to threat and the need to attain resources. These requirements lead to the development of the competing 'threat-protection' and 'drive-resource seeking' regulatory systems, which can often dominate the higher-order cognitive abilities of language, anticipation, self-awareness and rumination (Gilbert & Woodyatt, 2017).

Within the context of social anxiety, Gilbert (2014b) places particular importance on one's sense of self, not only from the perspective of self-appraisal, but also the awareness of how one may be regarded by others. Although conceptualised as problematic in traditional cognitive models (e.g., Clark & Wells, 1995), Gilbert emphasises this interpersonal awareness as an adaptive mechanism, which has evolved to navigate the hierarchical dynamics of early social groups. However, the activation of such systems may lead to either an increased tendency for individuals to engage in threat responsive behaviours, such as avoidance, or drive behaviours including excessively striving to gain approval in the eyes of others (Gilbert, 2014a). Gilbert proposes that the consequence from

overly adopting such behaviours is an increase in difficulties such as shame and self-criticism, each of which is positively associated with social anxiety (Cox, Fleet & Stein, 2004) and specifically with PEP (Cândeia & Szentágotai-Tătar, 2017).

Gilbert (2009) proposed that therapy should help the person to create a balance between the three regulatory systems. This means focusing on the development of one's affiliative soothing system in order to increase compassion towards the self and others and thus create equanimity with the threat and drive system, a process termed Compassionate Mind Training (CMT). Using this as a theoretical basis, Compassion Focussed Therapy (CFT; Gilbert, 2014b) has emerged, a promising transdiagnostic intervention that addresses shame and self-criticism in a range of clinical presentations (e.g., Leaviss & Uttley, 2015). In considering this evidence-base, although SAD has been found to be negatively associated with self-compassion (Werner et al., 2012), empirical evidence on the effectiveness of CMT/CFT generally in SAD is currently limited and exploratory in nature (e.g., Boersma et al., 2015). Furthermore, there is a paucity of research into the effects of developing self-compassion and its impact on the underlying processes maintaining social anxiety, including PEP.

One notable exception is a recent study conducted by Blackie and Kocovski (2018b), who examined the impact of self-compassion on PEP in a socially anxious analogue sample of Canadian undergraduates. Following baseline measures of trait PEP, self-esteem and self-compassion, participants gave an impromptu speech as a social stressor induction. Participants were then randomised into one of three experimental conditions, namely a compassionate writing, a rumination elicitation, or a control condition in which participants reflected on their speech as they would normally. Participants in the compassionate writing condition reported significantly less PEP pertaining to the speech and a greater willingness to engage in future social situations 24-hours after the experimental manipulation, compared to both the rumination and control groups. Furthermore, participants in the compassionate writing group reported significantly better

self-perception of their performance. Blackie and Kocovski (2018b) concluded that brief CMT interventions can increase self-compassion and may therefore act as a potential buffer against PEP, as well as increasing positive self-appraisal and future social engagement. However, these initial findings require further exploration and replication, in order to build upon both the generalisability and validity of the utility of CMT based approaches within SAD (Westfall et al., 2015).

Additionally, within studies that have explored self-compassion in the context of social stressor experimental manipulations, the majority have implemented the technique of compassionate letter writing, to the neglect of alternative mechanisms of action. These studies have found that compassionate writing is an operationalisable and effective technique in ameliorating a range of variables, including negative affect (Leary et al., 2007), state anxiety (Arch et al., 2018) and in the case of Blackie and Kocovski (2018b), PEP. However, it is yet to be made clear if these findings are replicable, and if variations in efficacy may exist between compassionate writing and alternative self-compassion techniques within similar experimental conditions.

2.1.4 The Potential Role of Compassionate Imagery

Within CMT, self-compassionate attributes including distress tolerance, self-empathy, non-judgement, and care-motivation are instilled from a position of warmth in order to develop the ‘compassionate-self’ (Gilbert, 2009; 2014b). A wide range of multimodal attentional, behavioural, cognitive and imagery-based techniques are implemented to achieve this aim. A technique of particular interest within the present study is compassionate imagery, and how this may operate within the context of social anxiety. Compassionate imagery describes the practice of developing an image which both epitomises and directs the core qualities of compassion towards the individual (see Gilbert & Proctor, 2006). Holmes and Mathews (2010) have shown that imagery is a strongly emotive multisensory process, and there is a consensus that negative self-imagery plays an

instrumental role in the maintenance of social anxiety (e.g., Clark and Wells, 1995; Hofmann, 2007; Rapee and Heimberg, 1997). Images in social anxiety typically take the form of distorted negative self-perceptions viewed from an observer perspective, and they are often linked to adverse prior experiences (Hackmann et al., 2000).

Experimental studies have previously demonstrated that manipulating imagery content, both positively and negatively, can have a corresponding effect on anxiety, performance perceptions and PEP (Hirsch et al., 2006; Makkar & Grisham, 2011; Stopa & Jenkins, 2007). Both positive and negative imagery inductions can also result in specific neurobiological regional activation, including within the amygdala (Costa et al., 2010; Weymar & Schwabe, 2016). As these modular areas of the brain are intrinsic to the threat-protection system in Gilbert's (2009) conceptualisation of compassion, extrapolation of these findings suggests that compassionate imagery-based techniques may develop the requisite affiliative emotional response from a perceptual 'bottom up' approach, rather than via language-based higher order cognition which draws upon processes such as semantic memory (Holmes & Mathews, 2010).

Compassionate imagery may also have additional benefits following socially ambiguous situations due to its competing cognitive demands. In support, experimental research has found that implementing a visual exercise following the presentation of trauma related stimuli resulted in significantly fewer intrusive images compared to a control group over a follow up period (Holmes et al., 2004). These authors suggested that the perceptual representation of events in memory can be influenced by secondary exercises which draw upon competing neurological activation. Applying this idea to PEP, it seems reasonable to propose that the induction of a compassionate imagery exercise following a socially ambiguous situation could inhibit the activation of negative imagery and autobiographical memories typically experienced during the post event period (Hirsch et al., 2004). In further support, Holmes et al. (2004) showed that a verbal exercise resulted in an increase of intrusive images.

2.1.5 Aims of the Present Study

Taken together, brief compassion-based exercises, such as compassionate letter writing and compassionate imagery may be an effective means to address several of the cognitive maintaining processes, such as PEP, inherent within SAD. Furthermore, compassionate imagery techniques may be particularly effective at reducing PEP in comparison to previously explored CMT exercises, such as letter writing. The rationale for this proposal is that the imagery technique increases the affiliative affect from emotionally resonant neuro-regional activation and the activation of a competing, positive image serves to inhibit intrusive negative imagery typically experienced during the PEP period.

To explore this, the present study aimed to conduct a partial replication of Blackie and Kocovski's (2018b) experimental design by comparing the effectiveness of a brief compassionate letter writing exercise with a compassionate imagery intervention on PEP in a social anxious analogue sample. As a result, the study had three experimental conditions, a compassionate imagery condition, a compassionate writing condition, and a reflective writing condition developed as a control group. Similar to Blackie and Kocovski's research, the current study also explored performance appraisal, affect and willingness to communicate. In contrast to Blackie and Kocovski, the current study also included a measure of state social self-esteem, to measure the negative self-appraisals inherent within SAD.

The study examined the following hypotheses:

- 1) Both the compassionate writing and compassionate imagery groups will be significantly more effective than the control group in reducing participants' PEP.
- 2) Both compassionate writing and compassionate imagery groups will be significantly more effective than the control group in increasing state self-compassion, state self-esteem, willingness to communicate, affect and speech performance perceptions.

- 3) The compassionate imagery group will be more effective at decreasing PEP than the compassionate writing group and the control group.

2.2 Method

Ethical approval was obtained from the School of Psychology Ethics Committee and Research Integrity and Governance Team (see Appendix A).

2.2.1 Design

The current study comprised of an independent measures randomised controlled design exploring the between-subjects factor of condition (compassionate imagery, compassionate writing or control). Dependant variables; including post event processing, self-esteem, self-compassion, affect, performance perceptions and willingness to communicate in future social situations were measured at baseline to assess group comparability and post-manipulation to determine the effect of conditions. The study was conducted over three timepoints: an initial screening, a laboratory based experimental session, and a 24-hour follow up.

2.2.2 Participants

Participants were students and staff members of a university based within the South of the UK, who either received student credit or an electronic gift voucher as thanks for their participation. Inclusion criteria for the study specified that participants self-report a degree of anxiety in social situations, by scoring equal or above one standard deviation of a normative mean on the Social Interaction Anxiety Scale (Mattick & Clarke, 1998). In addition, as dysphoric mood and depressive rumination have each been indicated to be confounding factors in the measurement of PEP in previous research (Sluis et al., 2017), participants scoring within the ‘severe’ range on the depressive subscale of the Hospital Anxiety and Depression scale (\geq

15; HADS; Zigmond & Snaith, 1983) were excluded from participation. In total, 173 potential participants completed the initial screening measures. From this, 137 were eligible to progress to the experimental phase and 34 were screened out due to having a SIAS score of less than 29. Two participants were excluded on the basis of low mood and signposted to relevant resources.

Following screening, all eligible participants were invited to attend the second phase of the study. 87 participants attended and completed the initial consent and baseline measures. Five participants were excluded at this stage because their SIAS scores had dropped below the cut-off, and one participant chose to withdraw from the study after receiving the speech brief. Participants were block randomised into their respective groups (imagery, writing, control) upon completion of the speech exercise. All 81 remaining participants completed phase two of the study and the 24-hour follow up measures, with a mean follow up response time of 1.17 days after the experimental session. No participants were deemed to be outliers in their response time, and therefore all 81 participants were included in the analysis. Due to an administrative error, nine participants' baseline 'Willingness to Communicate' measures were not recorded; however, all other data were complete. This sample size was deemed to be appropriately powered from a priori calculation via G*Power 3 (Faul et al., 2007), which utilised the multivariate effect from Blackie and Kocovski's (2018b) study (Pillai $V = .22$) when exploring seven dependant variables (power = .80, $p < .05$).

In regards to demographics, participants' ages ranged between 18 and 42 ($M = 21.06$, $SD = 4.62$). 84% of participants identified as female ($n = 68$), the remainder identified as male ($n = 13$). Participants reported their ethnicities as predominantly White British (47.2%), followed by Any Other White Background (19.1%) and Any Other Mixed Background (4.5%; see Appendix W for a complete overview). Three participants were university staff members, the remainder undergraduate or postgraduate students.

2.2.3 Measures

Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998). A measure of anxiety pertaining to social and interpersonal interactions, the SIAS consists of 20 items scored on a five-point Likert scale from zero to four. Total scores range from 0-80, with higher scores indicating elevated social anxiety. The SIAS demonstrates excellent test-retest reliability and construct validity (Heimburg & Turk, 2002; Mattick & Clarke, 1998) and has been recommended as a psychometrically suitable screening tool for use with undergraduate research (Rodebaugh et al., 2006). A comparable normative sample of university undergraduates provided the cut off score for the current study, determined as one standard deviation about the mean (≥ 29 ; Mattick & Clarke, 1998). This cut off was chosen to ensure feasibility of recruitment, in addition to its previous use within social anxiety research (Stopa et al., 2012). The SIAS demonstrated good internal consistency within the current study ($\alpha = .82$).

Hospital Anxiety and Depression Inventory – depression subscale (HADS-D; Zigmond & Snaith, 1983). The depression subscale of the HADS consists of seven items; each of which is rated on a four-point scale. Scores range from 0-21, with higher scores indicating lower mood state. The HADS was developed as a screening measure within non-psychiatric settings; it is not intended for assessment of severe mood difficulties, and places significant emphasis on the anhedonic nature of low mood. As such, a cut off of equal or above 15 (severe range) was implemented as an exclusion criterion. The HADS demonstrated good internal consistency within the present study ($\alpha = .84$).

Self-Compassion Scale (SCS; Neff, 2003b). The SCS is a Likert based 26-item measure of Neff's (2003a) six-factor intercorrelated model of self-compassion. Subdomains include the psychologically buffering constructs of self-kindness, common humanity and mindfulness, with the opposing negative subdomains of self-judgement, isolation and overidentification. According to Neff (2003b) there is validity in a higher order factorial model, meaning that a total score may be calculable reflecting trait self-

compassion. This higher order model has been critiqued in recent publications, with arguments that a six factor model may best reflect the construct (Brenner et al., 2017; Muris & Petrocchi, 2017; Muris et al., 2018). In response, counter arguments have been made in support of the utility of a total scale score (Neff et al., 2019). In considering the evidence base, it was deemed pertinent in the present study to explore the SCS as a unitary construct to enable comparability with previous research, whilst additionally exploring the six subdomains within secondary analysis to ascertain if any particular element of self-compassion could be related to observed changes in PEP. In the present study, the SCS demonstrated excellent internal consistency ($\alpha = .91$).

In order to explore the effect of condition on state self-compassion, a modified version of the SCS (S-SCS) was obtained from Arch et al. (2014). This measure rephrases items to assess the extent in which participants compassionately respond towards their speech; e.g. “following my performance, I am trying to take a balanced view of the situation”. The S-SCS has demonstrated good internal consistency in both previous research (Arch et al., 2014: $\alpha = .88$) and the present study ($\alpha = .95$).

Post Event Processing Inventory (PEPI; Blackie & Kocovski, 2017). The PEPI is a measure of negative ruminative thinking following social interactions and has two versions: trait (PEPI-T) and state (PEPI-S). Both versions have 12 items, which measure three subdomains; frequency, intensity and self-judgement. An overarching higher order factor of PEP can be inferred, with total scale scores ranging from 12-60. Psychometric analyses of both versions of the PEPI demonstrated excellent internal consistency and test-retest reliability with an undergraduate sample (Blackie & Kocovski, 2017). Internal consistency within the current study for the PEPI-T and PEPI-S was $\alpha = .92$, and $\alpha = .92$ respectively.

Positive and Negative Affect Scale (PANAS; Watson et al., 1988). The PANAS measures positive and negative affect and is widely utilised within clinical research. The two subscales comprise ten items each, which are rated on a continuum ranging from one

(very slightly or not at all) to five (extremely). Scores range from 10-50 for both subscales. The PANAS has good test-retest reliability for both positive (.79) and negative domains (.81; Watson et al., 1988), and both factors demonstrated good internal consistency within the current study (positive affect $\alpha = .86$, negative affect $\alpha = .81$).

Rosenberg Self Esteem Scale (RSES; Rosenberg, 1965). The RSES is a ten-item unidimensional measure of trait self-esteem, which uses a four-point Likert scale ranging from one (strongly disagree) to four (strongly agree). The RSES comprises both positively and negatively (reverse scored) worded questions and total scores range from 10-40, with higher scores indicative of higher trait self-esteem. The internal consistency of the RSES in this study was good ($\alpha = .84$).

State Self Esteem Scale - performance and social subscale (S-SES; Heatherton & Polivy, 1991). Within the S-SES, two subdomains (performance and social) were selected to compare state self-esteem following experimental manipulation. Each subscale consists of seven items ranging from one (Not at all) to five (Extremely), and subscales may be combined to derive a total score. Although the S-SES contains a third 'appearance self-esteem' subscale, this was not included in the current study design, as findings from Heatherton and Polivy (1991) indicated both the performance and social subdomains to be most sensitive to momentary change in self-esteem as a result of experimental manipulation. Cronbach's alpha for the current study was excellent ($\alpha = .93$).

Willingness to Communicate Scale (WTC; McCroskey, 1992). The WTC is designed as a probability-estimate scale assessing respondents' apprehension about engaging in future social interactions. It comprises 20 hypothetical social scenarios (such as standing in a line with a friend), which participants rate in relation to how likely they would be to communicate on a scale from 0 (never) to 100 (always), provided they had free choice. Within these 20 questions, eight are unscored and serve as distractor items. Subscales consist of four domains, reflective of common social contexts (group discussion, meetings, interpersonal conversation and public speaking). A total score can also be calculated. Two

American lexical items were converted to their English counterparts (physician to doctor, garbage to refuse). Internal consistency for the WTC was very good ($\alpha = .87$).

Speech Performance Rating Form (PRF; Rapee & Lim, 1992). The PRF asks participants to rate their performance on a five-point Likert scale comprising of 12 specific items (e.g., stuttered) and 5 global items (e.g., appeared confident). Total scores range from 0-68, with higher scores indicating a better perception of performance. Internal consistency for the present study was good ($\alpha = .83$). In addition to this outcome measure, baseline anticipated speech performance ratings were additionally obtained via a Visual Analogue Scale (VAS) measure, whereby participants rated their expected speech performance from 0 (not at all well) to 100 (extremely well). This measure was conducted to explore any potential pre-condition variations.

2.2.4 Manipulation Check Measures

There were two manipulation checks: one related to the speech exercise and the other to the intervention conditions (compassionate writing versus compassionate imagery). In order to ensure that the speech exercise had increased levels of state anxiety, participants rated their state anxiety on a 0 (no anxiety) to 100 (extremely anxious) visual analogue scale (VAS; Wolpe, 1969) prior to being made aware of the upcoming speech. Following the speech, they rated their highest level of anxiety during the speech. After they had completed the intervention, participants rated the degree to which they felt able to remain engaged with the condition on a 0 (not at all) to 100 (extremely) scale.

2.2.5 Procedure

The study was advertised on an online research platform and by posters placed around the university campus (Appendix B). It was described as a study seeking individuals who experience a degree of social anxiety to explore how people managed after participating in social situations. Potential participants were directed to an online screening questionnaire including an initial consent process, demographic questionnaires and the

SIAS and HADS-D. Eligible participants were then contacted by the researcher by email, provided the full patient information sheet (Appendix E), and invited to attend the experimental phase of the study. Those who were not eligible at the screening phase were provided with an electronic debrief (Appendix F) and were signposted to relevant services if their scores indicated that they were experiencing a marked episode of low mood.

Participants met the researcher in a laboratory at the University and provided written consent for the baseline portion of the experimental session (Appendix C). In the following order, baseline measures of trait PEP, trait self-esteem, state affect, trait self-compassion and state willingness to communicate were collected via an electronic data capture programme. Following this, participants completed a VAS measure of state anxiety, before being provided with a written brief stating that they would now be requested to perform an impromptu speech (Appendix S).

Within this brief, participants were informed that they would have two minutes to initially prepare, before being asked to perform their speech towards a video camera for a duration of three minutes. One of two possible topics were to be selected for this speech: 1) *Briefly outline your ideal job and describe why you would be suited for it*, or 2) *Describe the personal qualities and behaviours that make you a good friend*. Participants were prompted to ensure their speech lasted the full three minutes, even if that meant repeating information, and that judges who were expert in communication would evaluate their recorded performance on the basis of communicative ability, general employability and genuineness.

Following this brief, participants completed a second consent form (Appendix D), and the VAS measure of their anticipated performance for the upcoming speech. Participants then completed the speech with the camera directly facing them and the researcher present in the room, remaining interested but neutral in expression. Next, participants rated their highest level of anxiety felt during the speech (VAS) as a manipulation check, before a computerised block randomised strategy separated

participants into either the compassionate imagery ($n = 27$), compassionate writing ($n = 27$), or control groups ($n = 27$):

Compassionate imagery group: This audio exercise was adapted from a pre-existing imagery practice originally developed by Dr Dennis Tirsch, obtained from the *mindfulcompassion.com* online resource. Similar in design to imagery techniques implemented by Gilbert and Irons (2004), this exercise began by guiding participants through a brief grounding and soothing rhythm breathing practice, before developing an inner compassionate space using a series of multisensory prompts. Following this, participants were invited to visualise a version of themselves which possesses the core qualities of compassion; including strength, wisdom and warmth. Participants were then guided in visualising the flow of compassion from this ‘compassionate self’ into themselves, and prompted to picture how they might look and act throughout the remainder of their day if they embodied this compassionate self. A full transcript of this exercise can be found in Appendix U.

Compassionate writing group: Participants were asked to reflect on and respond to their speech in a writing exercise adapted from Lewis (unpublished thesis, 2018). This exercise combined instructions from several compassionate letter writing examples (Gilbert, 2009; Neff, 2011; Shapira & Mongrain, 2010). Participants were invited to initially reflect on their current thoughts and affect before engaging in a brief soothing rhythm breathing exercise (an initial step comparable to the imagery exercise). Following this, participants considered how someone cherished by them might respond to their speech performance. Participants were asked to articulate this through writing a letter to themselves from the perspective of this individual. Prompts throughout the exercise aimed to induce several of the core tenets of self-compassion, such as kindness (“try to infuse your letter with a strong sense of this person’s acceptance, kindness, caring and desire for your health and happiness”) and common humanity (“what would they write to remind you

that you are only human, that all people experience difficult times and have their own strengths and weaknesses?”).

Control group: Participants randomised to the control condition were provided with written instructions asking them to spend several minutes reflecting on and writing about their speech experience in a way in which they would normally think following such a task (Appendix V). This exercise was designed to create a standardised task of comparable length to the experimental conditions. It was also designed to prevent participants from engaging in activities that may have served as a distraction, as findings have indicated that distraction following a social stressor may reduce PEP (Blackie & Kocovski, 2016).

Each of the exercises spanned a mean time of 12 minutes and were piloted prior to the study on a voluntary sample of 10 students not prescreened against the study inclusion criteria, with minor amendments following feedback. Following completion of their randomly assigned condition, participants completed a VAS manipulation check of their engagement, followed by measures of affect, state self-compassion and performance perception in order to gain an accurate insight into any potential immediate effects of the intervention. After a 24-hour interval, participants were then emailed an online link to complete follow-up measures of state PEP, state self-compassion and willingness to communicate. Participants were asked to complete these measures as close to receiving the email as possible. Upon completion, participants received a study debrief along with their requested student credit or £7.50 gift voucher. Figure (2) depicts a flow chart of the study procedure in full.

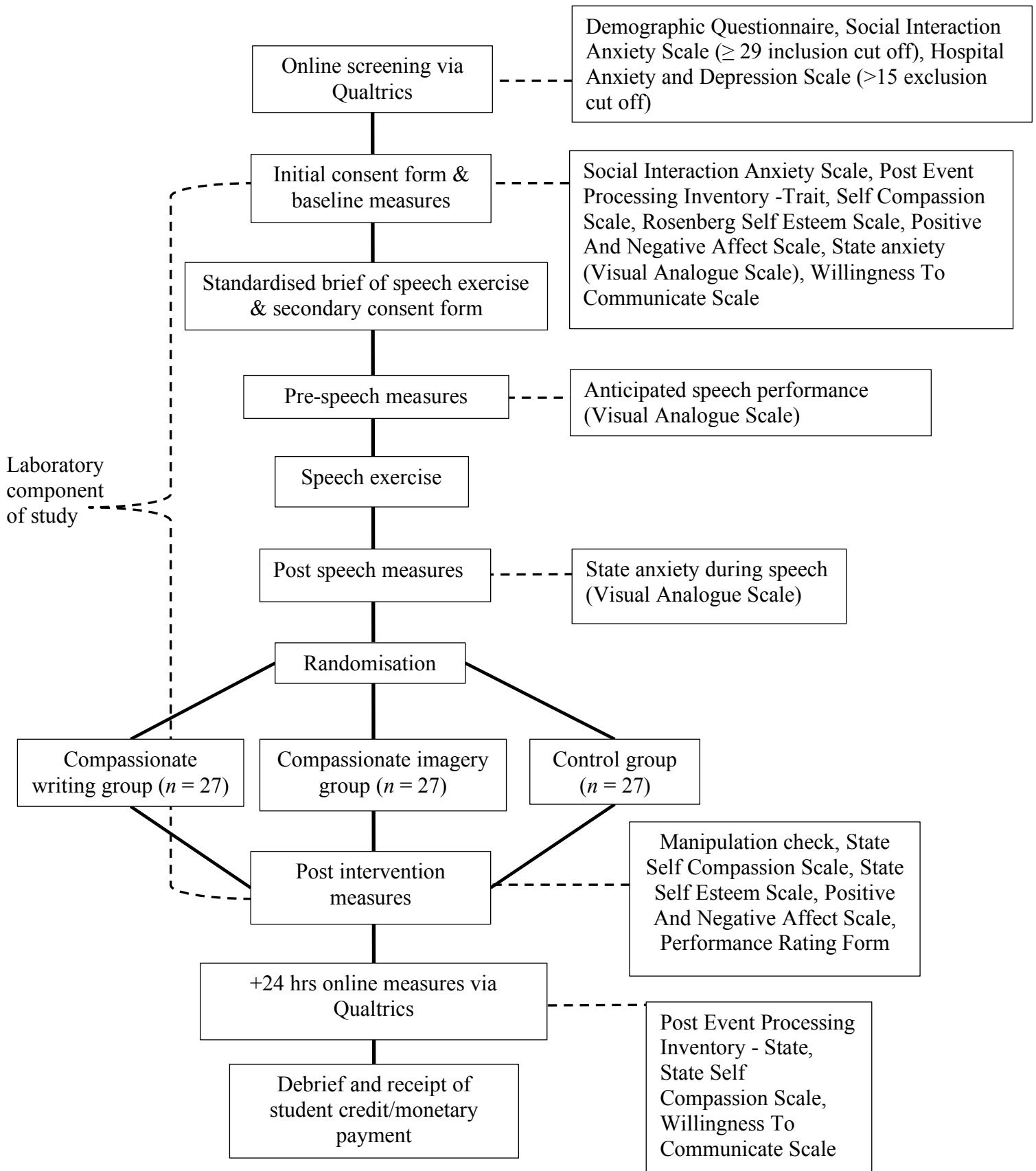


Figure 2. Flowchart depicting the study procedure

2.3 Results

2.3.1 Preliminary Analyses

Statistical analysis was conducted using SPSS version 25. Initially, all dependent variables were checked for extreme outliers using boxplots. When present (and appearing to exist due to novelty in participant responses rather than procedural errors) these were adjusted using a weight modification winzoration method of matching scores to the largest or second smallest value in the normally distributed dataset. This method is recommended by Tabachnick and Fidell (2007) as appropriate to both maintain the sample size and ensure the robustness of the statistical models employed. As a result, means tabulated in the following results section are reported in their adjusted form.

2.3.1.1 Baseline Differences Between Groups

Initially, a series of one-way analyses of variance (ANOVAs) and chi square tests were performed on demographic and baseline variables in order to explore any possible pre-existing differences between the three groups. Prior to analysis, normality was explored by visually inspecting histograms and the spread of z scores depicting skewness and kurtosis. The majority of z values were within the range of -1.96 to +1.96, meaning that skewness and kurtosis did not significantly differ from 0 ($p < .05$). These findings indicated that normality may be assumed (Field, 2018). Levene's test was additionally assessed for homogeneity of variance, with no significant findings demonstrated in the majority of baseline variables. An exception to these assumption tests was present for the demographic variable of age, likely due to the presence of outliers that were left unadjusted to assess any age-related variations between groups.

Chi square tests of ethnicity and gender and ANOVA's of age and baseline means (the latter reported in table 5) revealed no significant differences between conditions in ethnicity, $X^2(22) = 19.466, p = .616, V = .347$; gender, $X^2(2) = 2.932, p = .231, V = .190$;

depressive symptomatology, $F(2,78) = .482, p = .619, \eta_p^2 = .012$; trait social anxiety, $F(2,78) = .220, p = .803, \eta_p^2 = .006$; trait self-esteem, $F(2,78) = .232, p = .794, \eta_p^2 = .006$; trait self-compassion, $F(2,78) = .665, p = .517, \eta_p^2 = .017$; positive affect, $F(2,78) = .385, p = .682, \eta_p^2 = .010$; negative affect, $F(2,78) = 1.208, p = .304, \eta_p^2 = .030$; and willingness to communicate, $F(2,69) = .151, p = .861, \eta_p^2 = .004$. Additionally, there were no significant differences between conditions in predicted performance towards the speech task, $F(2,78) = .603, p = .550, \eta_p^2 = .015$. However, there was a significant main effect of age, $F(2,78) = 4.152, p = .019, \eta_p^2 = .096$, with post hoc Tukey analysis indicating the compassionate writing group's mean age was significantly higher than that of the compassionate imagery group ($p = .015$; see table 5 for means).

Although in the context of the nonsignificant findings reported above this was deemed a minor discrepancy, to maximise the robustness of the primary analysis MANOVA and MANCOVA analyses were compared, with age imputed as a covariate. As there were no significant difference between multivariate effects, the original statistical plan of conducting a MANOVA analysis was deemed appropriate.

Table 5.

Demographic and baseline variables.

Construct (measure)	Compassionate Imagery	Compassionate Writing	Control
	Mean (SD) <i>n</i> = 27	Mean (SD) <i>n</i> = 27	Mean (SD) <i>n</i> = 27
Age	19.44 (1.99)	22.89 (6.59)	20.78 (3.40)
Trait social anxiety (SIAS)	45.15 (10.68)	43.89 (7.28)	45.44 (9.20)
Depression (HADS-D)	5.48 (3.89)	4.59 (2.82)	5.19 (3.39)
Trait post event processing (PEPI-T)	41.81 (10.13)	42.30 (5.92)	43.52 (7.95)
Trait self-compassion (SCS)	2.54 (.68)	2.50 (.59)	2.36 (.50)
Trait self-esteem (RSES)	25.26 (5.11)	25.85 (4.49)	25.04 (3.99)
Positive affect (PANAS)	23.74 (6.49)	24.22 (6.38)	25.30 (7.12)
Negative affect (PANAS)	16.81 (5.39)	16.33 (3.84)	18.41 (5.93)
Willingness to communicate (WTC)	15.00 (12.25)*	16.11 (12.76)**	17.12 (14.42)**
Pre-speech performance estimate (VAS)	36.44 (15.89)	31.63 (18.26)	35.37 (16.51)

* *n* = 22, ** *n* = 25

2.3.1.2 Manipulation Checks

2.3.1.2.1 Efficacy of the Speech as a Social Stressor

In order to ascertain the effectiveness of the speech in inducing state anxiety, a 2 x 3 mixed ANOVA was conducted. The assumptions of normality and equality of covariance, assessed via *z* scores and Box's test, were each found to be within appropriate ranges. As expected, the main effect of group, $F(2,78) = .836, p = .437, \eta_p^2 = .021$, and the interaction between time and group, $F(2,78) = .159, p = .854, \eta_p^2 = .004$, were both nonsignificant. However, as predicted, there was a significant main effect of time, $F(2,78) = .159, p = < .001, \eta_p^2 = .770$, indicating that the speech succeeded in increasing participants' levels of state anxiety to a comparable level across conditions.

2.3.1.2.2 Engagement in Condition Exercises

Participants' engagement in the two experimental compassion-based exercises and the control exercise was compared via assessing participants' self-reported VAS scores, completed following the manipulations. Of the 81 participants, four were identified as extreme outliers, reporting their ability to engage with the exercise below 40% (imagery $n = 2$, writing $n = 1$, control $n = 1$). As it was unclear if this lack of engagement was a result of extraneous factors or due to participants finding the exercises intrinsically challenging, primary analysis was performed with these participants included in the dataset from the principle of intention to treat. Additionally, secondary analysis was performed with non-engagers removed to assess for any variations between results. A one-way ANOVA indicated that mean engagement between groups with outliers remaining did not significantly differ, $F(2,78) = .374, p = .689, \eta_p^2 = .010$. Means and standard deviations of the reported manipulation check measures can be viewed in Table 6.

Table 6.

Manipulation check measure means across groups.

	Compassionate Imagery Mean (SD) <i>n</i> = 27	Compassionate Writing Mean (SD) <i>n</i> = 27	Control Mean (SD) <i>n</i> = 27
Pre-speech anxiety	34.85 (22.17)	32.52 (15.05)	37.81 (20.17)
Anxiety during speech	71.93 (14.23)	72.81 (15.29)	75.93 (10.42)
Engagement in condition	71.30 (19.41)	75.26 (15.27)	73.93 (16.44)

2.3.2 Primary Analyses

2.3.2.1 Exploring the Effect of Condition on State-Self Compassion

To explore the effect of condition on state-self compassion, a 2 x 3 mixed ANOVA was conducted on state-SCS measures completed immediately after the manipulation and at 24 hour follow up. There was a significant time*condition interaction, $F(2,78) = 6.405$, $p = .003$, $\eta_p^2 = .141$, with post hoc tests indicating both the compassionate imagery and writing groups having significantly higher levels of state self-compassion than the control condition at both time points ($p < .001$). There were no significant differences at post intervention and follow up for either the imagery, $t(26) = 1.758$, $p = .090$, $d = .22$, or the writing conditions, $t(26) = -.905$, $p = .374$, $d = .11$, indicating that levels of state compassion remained stable. There were no significant differences between the two different compassion-based interventions in their levels of state-self compassion ($p = .911$). There was a significant increase in self-compassion from post-manipulation to follow-up within the control condition, $t(26) = -3.522$, $p = .002$, $d = .46$.

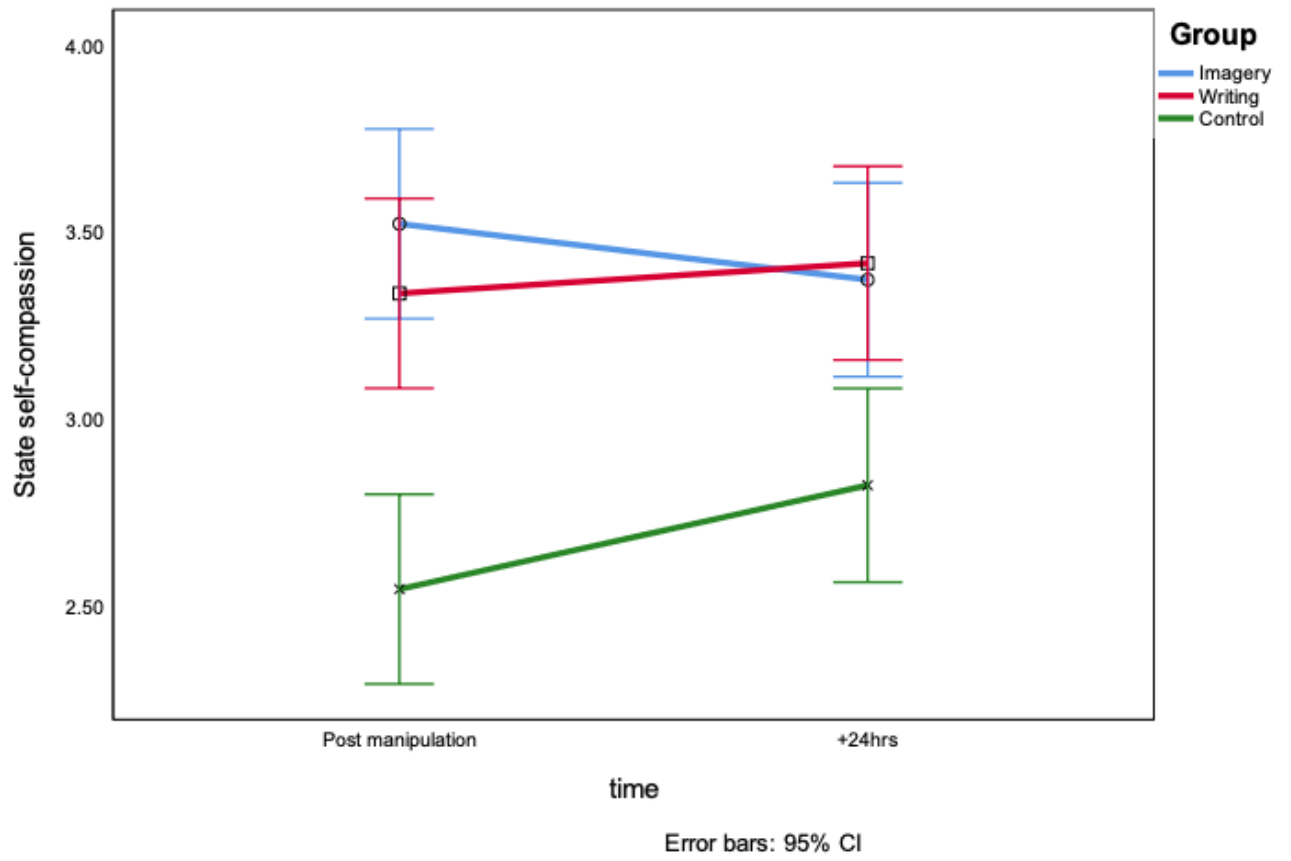


Figure 3. Mean differences between groups in state self-compassion.

Table 7.

Mean differences between dependent variables following intervention.

Construct (measure)	Compassionate Imagery	Compassionate Writing	Control
	Mean (SD) <i>n</i> = 27	Mean (SD) <i>n</i> = 27	Mean (SD) <i>n</i> = 27
State self-compassion post manipulation (S-SCS)	3.52 (.63)	3.34 (.71)	2.55 (.64)
State self-compassion + 24hrs (S-SCS)	3.37 (.74)	3.42 (.70)	2.82 (.72)
State self-esteem (S-SES)	43.22 (9.76)	39.93 (8.91)	31.41 (10.20)
Positive affect post condition (PANAS)	27.00 (7.65)	25.52 (8.56)	20.78 (6.39)
Negative affect post condition (PANAS)	12.19 (2.65)	15.70 (4.28)	22.52 (7.40)
Willingness to communicate (WTC)	41.99 (13.50)	37.04 (12.60)	38.18 (14.75)
Post speech performance rating (PRF)	31.96 (9.23)	30.93 (6.67)	25.22 (8.86)
State post event processing (PEPI-S)	22.07 (11.80)	23.26 (6.13)	29.33 (10.25)

2.3.2.2 Exploring the effect of condition on PEP, Performance Appraisal, Willingness to Communicate, Affect and Self-Esteem

In order to assess the effect of condition on PEP, performance appraisal, willingness to communicate, self-concept and state affect, a one-way multivariate analysis of variance (MANOVA) was conducted. To approximate the presence of multivariate normality, univariate normality was assessed by visually inspecting histograms and the range of z scores detailing skewness and kurtosis. Histograms were visually deemed acceptable, with no z scores falling outside the ± 1.96 range (Field, 2018). As univariate normality of residuals is a prerequisite of multivariate normality, although this assumption could not be assumed with certainty, this was deemed tenable. Secondly, although univariate outliers had been identified and adjusted accordingly, the presence of multivariate outliers was explored by calculating and measuring the Mahalanobis distance on a chi-square distribution. This calculation identified one data point scoring $< .001$, indicating the presence of a multivariate outlier (Tabachnick and Fidell, 2007). To address this, analysis was conducted with the participant both included and removed from the dataset, with no notable differences found between findings. Therefore, as it was unclear as to if this outlier was the result of an error or novelty in the participants response, it was deemed appropriate to include in order to maintain the full dataset (Leys et al., 2019).

To address the assumption of linearity, scatter plot matrices were interpreted and visually appeared to exhibit satisfactory associations between the majority of variables. Correlational analysis was additionally conducted to explore the absence of multicollinearity, with all variables correlating between the range of $R = .2 - .8$ as required (Field, 2018). In assessing the equality of covariance matrices, Box's test was examined and found to be significant ($p < .001$), indicating the assumption to be violated. Due to this factor, and given the equality of condition samples, Pillai's trace was deemed the most robust estimate of significance to interpret the main effect of analysis (Field, 2018).

There was a significant multivariate effect between conditions, $V = .498$, $F(12, 148) = 4.085$, $p < .001$, $\eta_p^2 = .249$. As a result, univariate analysis and Tukey HSD post hoc tests were explored further within each of the dependant variables in accordance with hypotheses.

2.3.2.2.1 State Post Event Processing

As shown in Figure 4, as hypothesised those in the self-compassionate groups experienced on average lower levels of PEP over the post speech period compared to control participants. In addition, the compassionate imagery group reported slightly less PEP than the compassionate writing group. Univariate ANOVA findings confirmed a significant effect of condition with a moderate to large effect size, $F(2,78) = 4.356$, $p = .016$, $\eta_p^2 = .100$. Post hoc Tukey HSD tests showed that the compassionate imagery group reported significantly less PEP compared to participants in the control condition ($p = .020$), but did not differ from participants in the writing condition ($p = .895$). In comparison, the compassionate writing condition only approached significance in comparison to the control group ($p = .061$).

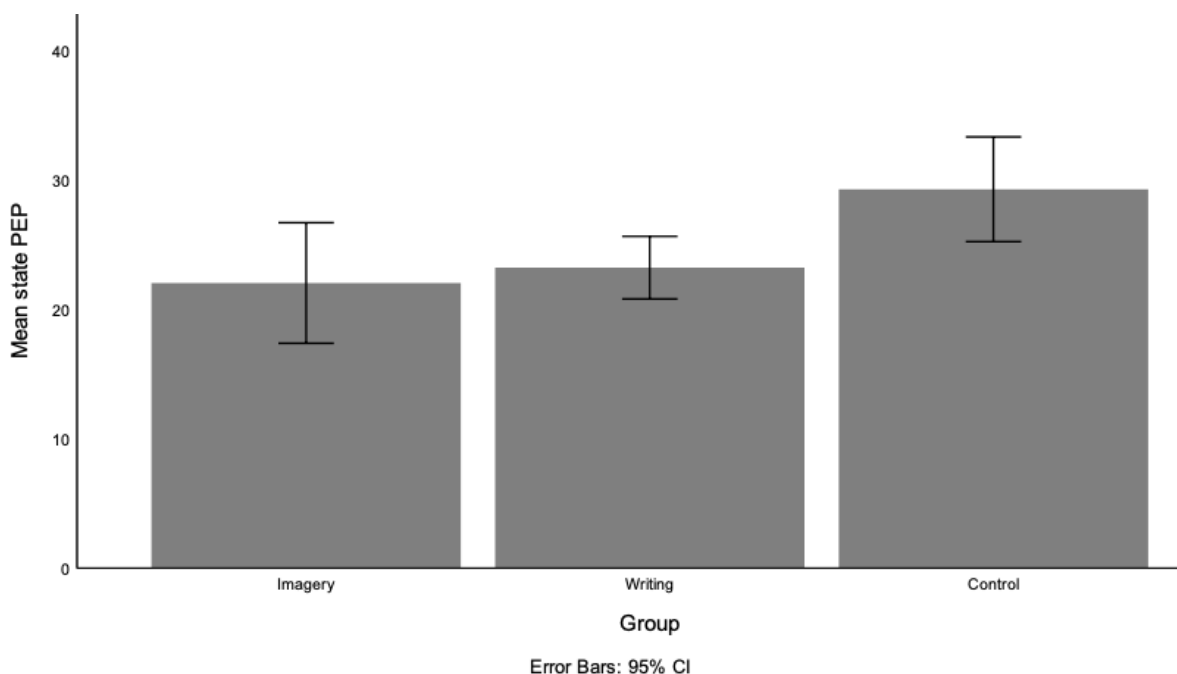


Figure 4. Mean differences between groups in post event processing.

2.3.2.2.2 Performance Perceptions

In regards to the effect of condition on performance appraisals, univariate ANOVA findings confirmed a significant effect of condition with a medium to large effect, $F(2,78) = 5.127, p = .008, \eta_p^2 = .116$. Follow up post hoc analysis showed that participants in the compassionate imagery and writing conditions rated their performance during the speech significantly better than the control group ($p = .011$ and $p = .037$ respectively). There were no significant differences between the imagery and writing conditions ($p = .891$).

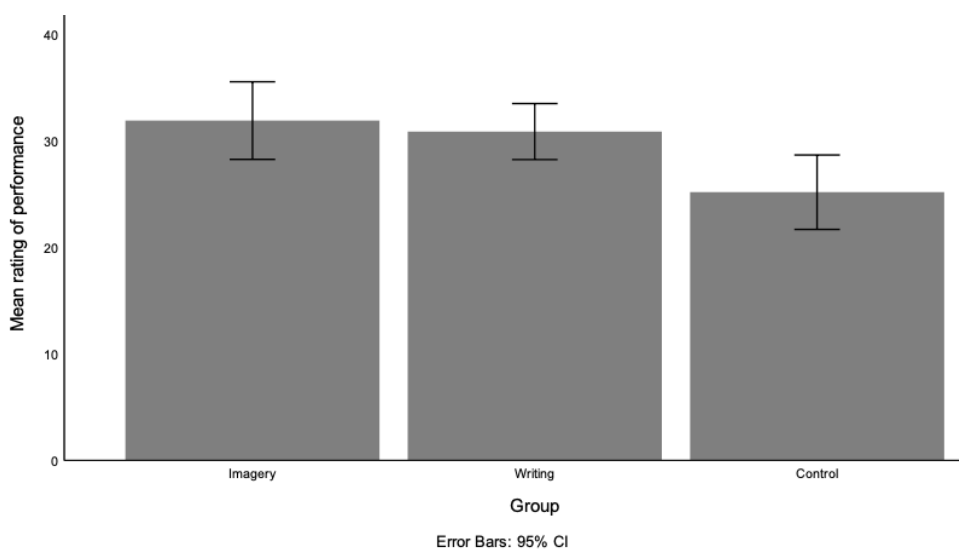


Figure 5. Mean differences between groups in performance appraisal.

2.3.2.2.3 Willingness to Communicate

Figure 6 displays group differences in willingness to communicate in hypothetical social situations. Univariate ANOVA indicated a nonsignificant effect, $F(2,78) = .977, p = .381, \eta_p^2 = .024$, indicating that contrary to hypotheses, all conditions were comparable in their willingness to communicate.

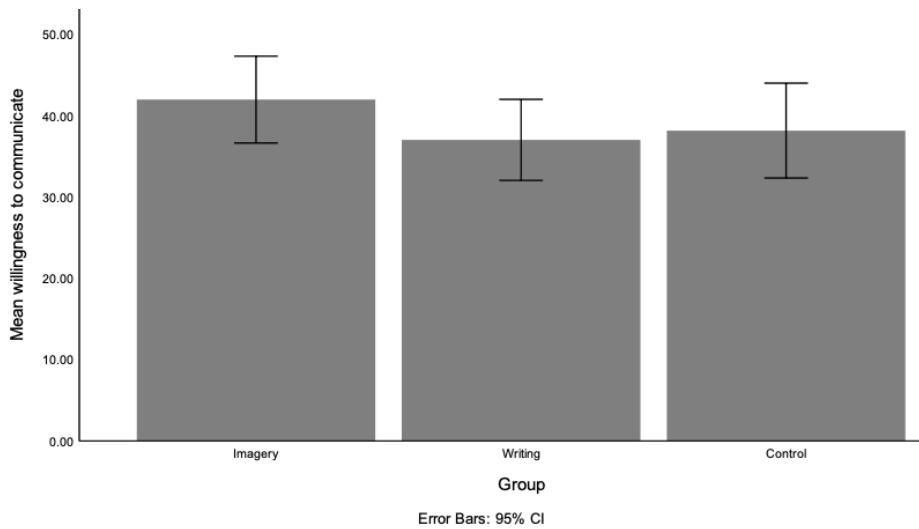


Figure 6. Mean differences between groups in willingness to communicate.

2.3.2.2.4 Affect

Participants in the compassionate imagery group reported higher levels of positive affect and lower levels of negative affect than both the writing and control groups, with the writing group displaying a similar but weaker trend (see figure 7). Univariate ANOVA findings found a significant difference in positive affect with a moderate to large effect, $F(2,78) = 4.960, p = .009, \eta_p^2 = .113$. As hypothesised, Tukey HSD analysis identified significantly higher levels of positive affect in both compassion-based techniques compared to control (imagery, $p = .011$; writing $p = .037$). There were no significant differences between the writing and imagery condition ($p = .891$).

Additionally, univariate ANOVA findings also confirmed a significant difference in negative affect across conditions with a large effect, $F(2,78) = 27.939, p < .001, \eta_p^2 = .417$. Post hoc testing found both compassion-based conditions negative affect to be significantly lower than that of the control group ($p < .001$). Additionally, the compassionate imagery group displayed significantly lower levels of negative affect compared to the compassionate writing group ($p = .038$).

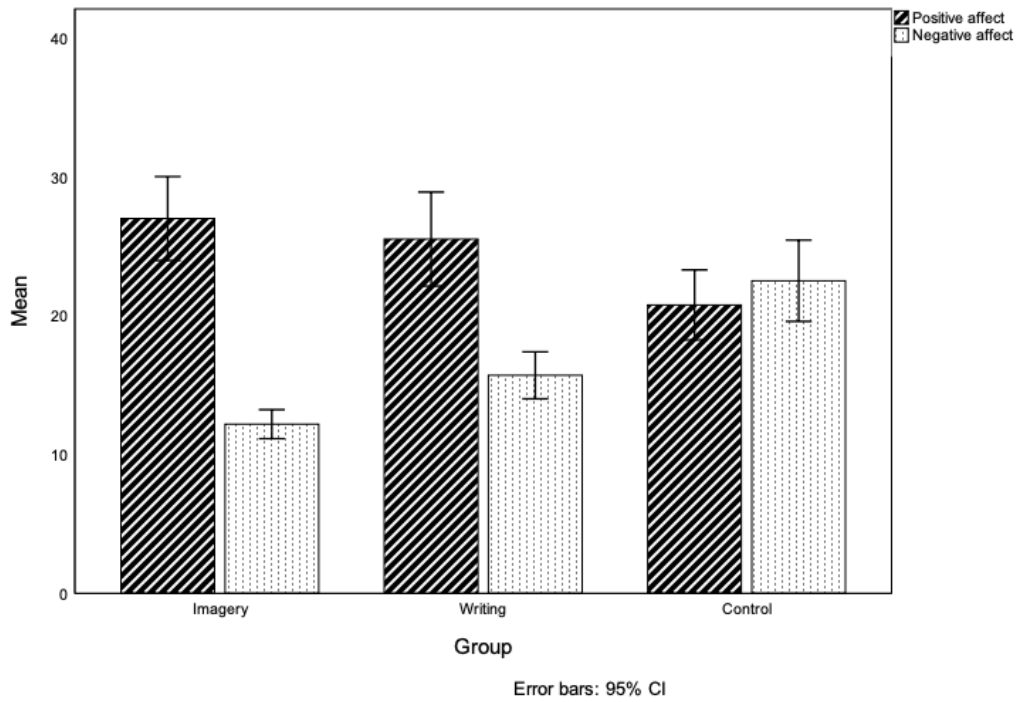


Figure 7. Mean differences between groups in positive and negative affect

2.3.2.2.5 State Self-Esteem

Univariate ANOVA findings confirmed a significant effect of condition with a large effect, $F(2,78) = 10.802, p < .001, \eta_p^2 = .217$. Post hoc tests showed that state self-esteem was significantly higher in both the imagery ($p < .001$) and writing conditions ($p = .005$) when compared to the control group. There was no significant difference between compassion-based techniques ($p = .424$).

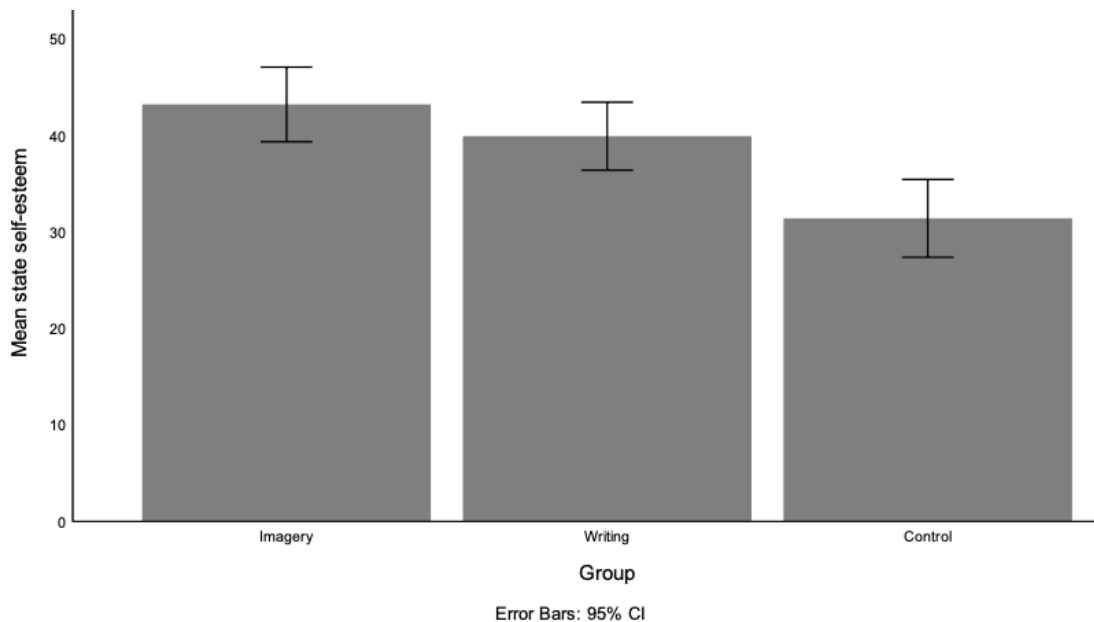


Figure 8. Mean differences between groups in state self-esteem.

2.3.3 Secondary Analyses

2.3.3.1 Exploring the Association between Subcomponents of Self-Compassion and PEP.

To further explore the possible mechanisms of action of self-compassion on the primary outcome measure of PEP, correlations between state PEP and each of the mean subscales of the state SCS completed following the experimental manipulations were performed. There were significant negative associations between PEP and two of the positive components of self-compassion; self-kindness ($r = -.327, p < .05$), common humanity ($r = -.245, p < .05$), but not mindfulness ($r = -.116, p = .302$). In comparison, there were stronger positive associations between PEP and the negative domains of self-judgement ($r = .732, p < .01$), isolation ($r = .728, p < .01$) and overidentification ($r = .769, p < .01$).

2.3.3.2 Exploring Variations in Findings Following Removal of Non-Engagers

The primary analysis reported above was compared with a secondary MANOVA with participants excluded if identified as non-engagers, to assess if any significant variations existed. Secondary analysis (reported in full in Appendix X) indicated no significant differences in results across the majority of variables. However, whereas

reductions in state PEP was only approaching significance for the compassionate writing condition when compared to control with all participants included in the analysis, this difference was found to be significant when non-engagers were removed ($p = .017$).

2.4 Discussion

The present study aimed to explore the effectiveness of both a brief compassionate imagery and compassionate writing intervention on PEP in a socially anxious analogue sample, following an impromptu speech exercise. The study also explored the effect of each intervention on factors evidenced to be impacted by and associated with PEP, including: self-esteem, affect, performance appraisal and willingness to communicate.

When compared to the control condition, the compassionate imagery group experienced significant reductions in PEP and negative affect, alongside significant improvements in self-compassion, perception of speech performance, state self-esteem and positive affect. However, counter to hypotheses, there were no significant improvements in participants' willingness to communicate.

Findings were similar for the majority of outcomes when comparing the compassionate writing condition to control. However, within the writing condition reductions in PEP failed to reach significance when adopting an intention to treat analytical strategy. The results also showed that when comparing between compassionate interventions, negative affect was significantly lower in the compassionate imagery group compared to the writing group, whereas all the other differences between variables were nonsignificant.

The significant reductions in PEP in the compassionate imagery condition compared to the control condition partially supported hypothesis one. This indicates that increasing self-compassion may potentially be an efficacious means to buffer against the threat dominant, critical ruminative cognitive process. However, it is of interest that reductions of PEP in the compassionate writing condition were non-significant and in contrast to

previous study by Blackie and Kocovski (2018b). Exploring this, it is relevant to note that following the removal of a small subsample of extreme outliers who reported difficulty engaging in their respective experimental conditions, significant reductions in PEP within both CMT conditions were found. This therefore suggests that these variations across interventions may be due to their acceptability, rather than their efficacy (Feinman, 2009). However, as the reason for this lack of engagement is unclear, removal of these participants from analysis increases risk of bias and should be interpreted with caution.

As hypothesised, compared to controls participants in both CMT conditions demonstrated significant improvements in their self-appraisals of speech performance. This suggests that participants in both experimental conditions were able to consider their performance from a more grounded, objective perspective in keeping with the mindset of common humanity than participants in the control condition. This indicates that compassion-based techniques may be an effective means to ameliorate the negative, attributionally biased self-appraisals widely evidenced to maintain negative self-concept within cognitive and evolutionary models of SAD (Clark & Wells, 1995; Gilbert, 2014a; Hofmann, 2007). These findings further support the results of Blackie and Kocovski's (2018b) previous study, and are consistent with wider empirical findings beyond the field of social anxiety (Leary et al., 2007).

As hypothesised, but counter to findings by Blackie and Kocovski (2018b), both CMT exercises resulted in significant improvements in affect, suggesting that the experimental participants were able to effectively divert attention away from a dominant threat-protection response and engage in the requisite affiliative, contentment emotional regulation system required for developing self-compassion (Gilbert, 2009). State self-esteem was also significantly higher in the two compassion interventions compared to the controls. The constructs of self-compassion and self-esteem, although positively correlated, differ (Barnard & Curry, 2011). Neff (2011) argued that self-compassion is potentially more protective than self-esteem because it allows individuals to acknowledge and warmly

accept the presence of failure and imperfection. Building upon these arguments, the present study highlights that by developing a self-compassionate mindset, improvements may also be made within self-esteem, a process noted by Gilbert (2000) as being a hierarchical, rank focussed social mentality. These improvements may be particularly useful in the context of the subordinate, negative self-concept often found within socially anxious populations (Gilbert, 2014a).

Counter to hypothesis two and previous findings, there were no significant differences between conditions in relation to participants' willingness to communicate in hypothetical future social interactions. Considering this in relation to Blackie and Kocovski's (2018b) findings, it may be that differential methodological or sampling factors, such as cultural differences, could have resulted in this variation (McCroskey & Richmond, 1990). However, as willingness to communicate showed the smallest significant improvements within Blackie and Kocovski's (2018b) study, the current findings may reflect the difficulties in generalising a context-specific intervention to a broader ecological outcome. As SAD is typically a long-term condition with many challenges (i.e., not just giving a speech), strongly maintained by avoidance (Fehm et al., 2005), it is possible that a more intensive CMT programme applicable to a range of contexts outside that of a speech may be required to further impact upon this cognitive process.

2.4.1 Comparing Between Compassion-Based Techniques

In comparing effects between CMT conditions, although the imagery group displayed a stronger trend across all outcomes, only negative affect was significantly lower than the writing condition. This is counter to the hypothesised added benefits of compassionate imagery extrapolated from the wider research of Holmes et al. (2004), which led to the proposal that the imagery group could be more effective in reducing PEP

due to placing additional competing demands on the cognitive domains responsible for the activation of negative and autobiographical intrusive images.

In considering these findings, it is possible that although the present study was appropriately powered to achieve the primary outcome of comparing levels of PEP between each experimental technique to a control arm, the sample size may have been inadequate to detect more subtle differences between CMT conditions to the point of significance (Jakobsen et al., 2019). However, the significant variations in negative affect lends support to the body of work by Holmes and Mathews (2010), which highlights the powerful emotional effects of imagery. Within their heuristic model (Holmes & Mathews, 2010), the benefits of imagery are theorised to be attributable to the overlapping nature of both bottom up and top down control processes. They propose that this overlapping pathway activates a range of supportive neurobiological systems, such as perceptual processing. This pathway may differ in emotional resonance when compared to language-based representative processing, theorised to be vulnerable to disruption by the activation of conflicting information from semantic memory (Holmes & Mathews, 2010). This model may explain the variations seen between conditions in levels of affect, and suggests that within the fields of social anxiety and CMT, utilising compassionate imagery techniques may be an impactful means to stimulate the affiliative, contentment system necessary to build self-compassion.

It is of relevance to note that previous research has reported iatrogenic responses following brief compassionate imagery practice, particularly within individuals who display high levels of self-criticism and anxious attachment styles (Rockliff et al., 2008; Rockliff et al., 2011). As socially anxious individuals can be more self-critical than individuals with major depression or other anxiety difficulties (Cox et al., 2004), the present findings indicate that compassionate imagery techniques are an accessible intervention within such a population. However, it is possible that a clinical sample displaying more complex presentations of SAD alongside comorbid emotional difficulties

may differ in their response. Further exploration of attenuating factors on the responsiveness to compassionate imagery and writing techniques within SAD may therefore be a pertinent aim for future study.

2.4.2 Implications for Theoretical Models of Self-Compassion and SAD

As levels of state self-compassion were higher in both CMT conditions compared to the control condition following the manipulations, it is reasonable to assume that participants were effectively able to draw upon self-compassion as a buffering mechanism to counteract social threat (Gilbert, 2014a). In exploring the relationship between the six sub-components of the SCS on PEP, with the exception of mindfulness, all sub-components were significantly correlated in the expected directions. However, the negative sub-domains demonstrated stronger associations than their positive counterparts. These findings, in conjunction with the main effects, indicate that participants assigned to the CMT conditions were able to adopt a less critical, isolating perspective and display self-kindness and openness during the post event period, therefore embodying a self-compassionate mindset (Neff, 2003a).

However, in light of the stronger associations found between the negative domains of the SCS and PEP, it is pertinent to address the current debate about the validity of using total scores of the SCS. There is a body of evidence suggesting that as the SCS comprises two opposing constructs and that reporting of a total scale score may overinflate effects within psychopathology (Brenner et al., 2017; Muris & Petrocchi, 2017; Muris et al., 2018). A recent synthesis of secondary data from over 20 diverse samples has disputed these arguments (Neff et al., 2019), with an indication that a single-bifactor model comprising of six compassionate subcomponents interacting as a global system offers the best fit. These findings provide justification for using the SCS as a total scale in the present study. However, as the SCS is based on Neff's (2003a) model, it is unclear whether any additional components of self-compassion (conceptualised by alternative theoretical

models) may have moderated the outcomes of the current study. In considering the evolutionary model of self-compassion (Gilbert, 2009), a particular attribute of relevance is distress sensitivity and tolerance. It is possible that improvements in this domain may have enabled participants to take initial steps in effectively identifying and turning towards their negative affect to allow for further compassionate action. This possibility highlights the need for the development of empirically validated measures of self-compassion which consolidate leading theoretical conceptualisations of the construct into one unitary measure. Measures such as these have recently been disseminated (Gu, Baer, Cavanagh, Kuyken & Strauss, 2020), and their incorporation in future SAD research may lead to further understanding of which particular attributes of self-compassion are responsible for the outcomes found in the present study.

2.4.3 Study Strengths

For partial replication studies, the requirement for an adequately powered sample to allow a robust comparison of findings is a key factor (Westfall et al., 2015). This was successfully achieved in the present study, along with effectively inducing self-compassion in both CMT conditions. To the author's knowledge, this was the first study to specifically explore the effects of a brief compassionate imagery intervention on the maintaining processes in SAD, namely PEP. As imagery is unanimously agreed to be a key maintaining factor for both SAD and PEP (Clark and Wells, 1995; Dannahy & Stopa, 2007), the current study further extends the evidence base and highlights the applicability of utilising compassionate imagery techniques in such a context. Furthermore, the inclusion and comparison of per-protocol and intention to treat statistical findings provides a comprehensive assessment of both the efficacy and acceptability of brief CMT within the domain of social anxiety (Ranganathan et al., 2016). As findings generally supported the predictions, this suggests that brief interventions may translate well to applied clinical settings.

2.4.4 Limitations

As in any study, methodological limitations exist and shall be addressed. Due to the experimental design, the positive effects of self-compassion on PEP can only be inferred in the context of a situationally specific speech task. As such, further research is required to gauge the impact of self-compassion on PEP across a wider range of social situations to adequately assess the generalisability of these findings. Additionally, although the present study demonstrated the efficacy of singular CMT interventions, it is unclear if repeated practice would result in comparable or greater benefits.

Although the effectiveness of both CMT conditions in inducing self-compassion was established via state measures, the causal factors underlying participant engagement are unclear. As fear of negative evaluation is a key feature of social anxiety, it was deemed appropriate not to review completed letters or be present when participants were engaging in the imagery practice, to maximise individual's openness to participate. However, this leaves uncertainty as to what extent variations may be attributable to extraneous confounders or intrinsic difficulties in applying CMT techniques. Considering this factor further, as the study sample were predominantly female, who have been evidenced to display slightly lower levels of trait self-compassion and higher levels of rumination thinking than males (Johnson & Whisman, 2013; Yarnell et al., 2015), it is unclear if the current findings would vary with a more gender representative sample. As it has been indicated that the degree of variance within male and female levels of trait self-compassion is similar (Hyde, 2005), Yarnell et al. suggests that gender differences in self-compassion should not be overemphasised within compassion based research. However, when also considering the acceptability of compassion-based interventions, males have been found to report significantly higher fears around acting self-compassionately (Gilbert et al., 2011). This may therefore result in difficulties for males with low trait self-compassion responding self-compassionately within a brief intervention context, such as conducted in the present study.

Although each of the CMT exercises were adapted from empirically valid interventions and reflected their targeted mechanisms of action, the extent to which incorporation of additional elements (such as soothing rhythm breathing) contributed to the observed effects is unclear. However, as rhythmic breathing is noted as an appropriate step to activate the parasympathetic nervous system to set the conditions conducive to imagery work (Gilbert & Irons, 2004), this was considered a pre-requisite. This was therefore additionally included within the writing condition to ensure comparability. Additionally, although attempts were made to balance each of the compassion-based exercises, variations in the design of each intervention require acknowledgement; for instance, the compassionate writing exercise requested participants reflect directly upon their speech in a compassionate manner, whilst the imagery exercise took the form of a more general and guided compassion based practice not linked to the speech. It is therefore unclear if such variations may have contributed to the observed variation in negative affect.

Finally, although the study design meant that blinding of participants to condition could not be possible, the methodology and resources of the present study prevented experimental blinding to participants' randomisation to their respective conditions. This may have increased the likelihood of experimenter bias (Holman et al., 2015). Although standardised instructions were provided across all groups to limit this possibility, this factor requires acknowledgment and control in future study.

2.4.5 Recommendations for Future Research

Although mean SIAS scores were above the recommended cut off to indicate a diagnosis of SAD (Heimberg et al., 1992), research within a clinical sample would be beneficial to evaluate the generalisability of these findings. Furthermore, comparison between CMT techniques and empirically supported therapeutic techniques, such as cognitive restructuring or mindfulness would be beneficial (Shikatani et al., 2014). Alternatively, to further understand the added benefits of the compassionate imagery

condition in reducing negative affect, it may be useful to compare against alternative evidenced based imagery techniques with no emphasis on self-compassion (Stopa et al., 2012). This may elucidate how much of the compassionate imagery's active component came from the buffering effects of self-compassion, rather than the potential disruption to the activation of prior autobiographical memories and the negative working self, as described by Conway and Pleydell-Pearce's (2000) Self-Memory Model.



Finally, as CMT based interventions were administered following the speech, it is unclear if findings would have differed if comparable interventions had been employed prospectively. It has been indicated that a brief compassionate writing exercise prior to a socially stressful task results in reductions in state anxiety, but not anticipatory processing (Harwood & Kocovski, 2017); however identifying whether any differing effects occur in relation to PEP would be a useful, pragmatic consideration of relevance to therapeutic application.

2.4.6 Conclusion

To summarise, the present findings support emerging evidence that developing self-compassion may be an efficacious means to buffer against a range of maintaining cognitive and emotional processes within social anxiety. Specifically, the current study has demonstrated that the application of a single CMT technique following a social stressor effectively leads to a reduction in negative affect, and improvements in self-appraisals of social performance, self-esteem and positive affect. Additionally, the buffering effect of developing self-compassion on the ruminative process of PEP has been evidenced, although variations in the acceptability of the CMT interventions were observed. Further research is warranted to explore both the efficacy and applicability of such techniques within clinical populations, to fully assess the potential of such modalities as an adjunct or alternative approach to empirically recommended therapeutic interventions.

Appendix A Ethical Approval

My Submissions (2)

Category	Submission ID	Project Title	Status	
	47179.A2	Exploring the Efficacy of both Compassionate Writing and Imagery in the management of Post Event Processing within Social Anxiety (Amendment 2)	Approved	View → Create Amendment Request Extension
	21022	Exploring the Efficacy of both Compassionate Writing and Imagery in the management of Post Event Processing within Social Anxiety	Approved	View → Create Amendment Request Extension

Appendix B Study Poster

Do you find public speaking challenging or experience social anxiety?



This doctoral research study is exploring how people who experience anxiety during social situations manage their thoughts and feelings about themselves.

Who can take part? Students and staff of Southampton University, who experience a degree of anxiety in social situations and have no significant hearing impairments.

Participating in this study involves completing a **5 minute** online questionnaire to check your suitability, before meeting with a researcher to complete a further session in building 44. This session involves completing further questionnaires and two brief activities. This will take around 45 minutes. You will then be asked to complete a **5 minute** online questionnaire after a 24 hour period.

Participants will receive either **11 course credits** if applicable, or a **£7.50 Amazon voucher** upon completion of the study.

If you are interested in taking part, please email J.M.Richards@soton.ac.uk or follow the link below to complete the screening questionnaire.

<https://tinyurl.com/yyafbsua>

Thank you!

Social situations study J.M.Richards@soton.ac.uk https://tinyurl.com/yyafbsua
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Social situations study J.M.Richards@soton.ac.uk https://tinyurl.com/yyafbsua

Appendix C Initial Consent Form

CONSENT FORM

Study title: Thoughts about the self following social situations

Researcher name: Jonathan Richards

ERGO number: 47179

Participant Identification Number:

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet (V1.3, 19/07/2019) and have had the opportunity to ask questions about the study.	
I agree to take part in this research project and agree for my data to be used for the purpose of this study.	
I understand my participation is voluntary and I may withdraw at any time for any reason. I am aware that if I were to withdraw I would not be eligible to receive student credit or a gift voucher, however none of my other participation rights will be affected.	
I understand that should I withdraw from the study then the information collected about me up to this point may still be used for the purposes of achieving the objectives of the study only.	
I understand that I will not be directly identified in any reports of the research.	
I understand that my personal information collected about me such as my name or contact details will not be shared beyond the study team.	

Name of participant

(print name).....

Signature of participant.....

Date.....

Name of researcher

(print name).....

Signature of researcher

Date.....

Appendix D Secondary Consent Form

SECONDARY CONSENT FORM

Study title: Thoughts about the self following social situations

Researcher name: Jonathan Richards

ERGO number: 47179

Participant Identification Number:

Please initial the box(es) if you agree with the statement(s):

I have read and understood the speech exercise brief (v1.1, 18/04/2019) and have had the opportunity to ask questions about the exercise.	
I give consent to be videotaped	
I understand that video recorded data will be stored securely for the purposes for this research study only.	
I understand my participation in this exercise is voluntary and I may withdraw for any reason. Although this will not affect the majority of my participant rights, I am aware that if I do decide to withdraw I will not receive either student credit or a gift voucher for my participation thus far.	
I understand that should I withdraw from the study then the information collected about me up to this point may still be used for the purposes of achieving the objectives of the study only.	

Name of participant

(print name).....

Signature of participant.....

Date.....

Name of researcher

(print name).....

Signature of researcher

Date.....

Appendix E Participant Information Sheet

Study Title: Thoughts about the self-following social situations

Researcher: Jon Richards

ERGO number: 47179

You are being invited to take part in the above research study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. You may like to discuss it with others but it is up to you to decide whether or not to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

My name is Jon Richards and I am a Trainee Clinical Psychologist undertaking this study as part of my doctoral thesis, under the supervision of Professor Lusia Stopa. This study is exploring ways in which people whom experience difficulties around social situations manage attitudes towards the self. It is of the hope that this study can help contribute to informing further research and psychological interventions within the field of social anxiety.

Why have I been asked to participate?

You have been asked to participate because you are a current University of Southampton student or staff member and have indicated that you experience some difficulty in social situations. We aim to recruit around 70 people to take part in this study.

What will happen to me if I take part?

Taking part in this study will involve you meeting with the researcher at building 44 on the Highfield Campus to complete several questionnaires and to take part in two brief exercises, both social and non-social. Overall, this will take approximately 45 minutes to complete. Following this, you will also be contacted by email to complete a short follow up questionnaire online after a 24-hour period, which will take approximately 5 minutes.

Are there any benefits in my taking part?

Although there are expected to be little direct benefits of taking part in the study, it is possible that taking part may assist some participants in responding better to social situations. Additionally, your participation may also help towards improving understanding around how people generally may better manage these situations, which may inform future therapeutic treatments.

Following completion of the study you will also be given the choice of receiving either 11 student credits (if an undergraduate psychology student) or a £7.50 amazon gift voucher.

Are there any risks involved?

Although there is little risk of taking part in this study, some people may experience a brief period of mild psychological discomfort or distress when completing one of the exercises. For those whom might find their involvement in the study distressing, relevant resources and signposting will be provided by the researcher.

What data will be collected?

Some personal data, such as your age and gender will look to be collected, in addition to several questionnaires looking to measure various aspects of wellbeing and the self. Personal data will be kept separate from completed questionnaires and you will be issued a pseudonymised study identification code to maintain your confidentiality between your personal information and questionnaire data. Only the researcher and supervisor will be able to use this code. Electronic data will be stored securely on an encrypted, password protected drive and paper consent forms will be kept in a securely locked cabinet on university premises. To maintain contact with participants during the course of the study period, the researcher will additionally be required to store personal contact details for the duration of the study period, again on a password encrypted hard drive.

Will my participation be confidential?

Your participation and the information we collect about you during the course of the research will be kept strictly confidential. Only members of the research team (the researcher and supervisor) and responsible members of the University of Southampton may be given access to data about you for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations.

Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your data. All of these people have a duty to keep your information, as a research participant, strictly confidential.

Do I have to take part?

No, it is entirely up to you to decide whether or not to take part. If you decide you want to take part, you will need to sign a consent form to show you have agreed to take part. If you choose not to participate there will be no consequence to you as a student or staff member of the university.

What happens if I change my mind?

You have the right to change your mind and withdraw at any time without giving a reason. Although this will not impact upon the majority of your participant rights, if you do wish to withdraw prior to fully completing the study please note that you will not receive

student credit or a gift voucher. If you withdraw from the study, we will keep the information about you that we have already obtained for the purposes of achieving the objectives of the study only, unless you specifically request otherwise. If you do wish to request this, study data you have provided may be withdrawn upon request up to the point of it being analysed and written up, estimated to occur during February 2020.

What will happen to the results of the research?

Your personal details will remain strictly confidential. Research findings made available in any reports or publications will not include information that can directly identify you without your specific consent.

Where can I get more information?

If you have any further questions please contact the researcher, Jon Richards (j.m.richards@soton.ac.uk), or alternatively Professor Lusia Stopa (l.stopa@soton.ac.uk).

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researcher, Jon Richards, who will do his best to answer your questions.

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, ‘Personal data’ means any information that relates to and is capable of identifying a living individual. The University’s data protection policy governing the use of personal data by the University can be found on its website (<https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page>).

This Participant Information Sheet tells you what data will be collected for this project and whether this includes any personal data. Please ask the research team if you have any questions or are unclear what data is being collected about you.

Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one

of our research projects and can be found at

<http://www.southampton.ac.uk/assets/sharepoint/intranet/ls/Public/Research%20and%20Integrity%20Privacy%20Notice/Privacy%20Notice%20for%20Research%20Participants.pdf>

Any personal data we collect in this study will be used only for the purposes of carrying out our research and will be handled according to the University's policies in line with data protection law. If any personal data is used from which you can be identified directly, it will not be disclosed to anyone else without your consent unless the University of Southampton is required by law to disclose it.

Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your Personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose.

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton will keep identifiable information about you for 10 years after the study has finished after which time any link between you and your information will be removed.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (<https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page>) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you for taking the time to read this information and for your interest in our study!

Appendix F Electronic Screening Debrief Statements

Screening below SIAS cutoff

Thank you for taking the time to complete these questionnaires and for your interest in participating in our study.

Unfortunately based upon the answers you have provided it is indicated that you are not eligible to participate in the next phase of the study. This is due to some of the questions that you have answered indicating that you may not experience anxiety in social situations to the level required for this research.

If you have any further questions about the study please contact the primary researcher, Jon Richards, at j.m.richards@soton.ac.uk, or Professor Lusia Stopa at L.Stopa@soton.ac.uk.

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk). Thank you again for taking the time and for your interest in this research.

Screening exceeded HADS cutoff

Thank you for taking the time to complete these questionnaires and for your interest in participating in the research study.

Unfortunately based upon the answers you have provided it is indicated that you are not eligible to participate in the next phase of the study at this timepoint. This is due to some of the questions that you have answered indicating that you may at present be feeling low in mood to a point specified as an exclusion criteria for this research.

If you feel you might need further support, please contact your GP or visit the University of Southampton's student enabling service

If you have any further questions about the study, please contact the primary researcher, Jon Richards, at j.m.richards@soton.ac.uk, or Professor Lusia Stopa at L.Stopa@soton.ac.uk.

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk). Thank you again for taking the time and for your interest in this research.

Appendix G Final Debrief Statement

Study title: Exploring the Efficacy of both Compassionate Writing and Imagery in the management of Post Event Processing within Social Anxiety

Final Written Debriefing Statement (V1.0, 08/02/2019)

ERGO ID: 47179

The aim of this research was to explore the effectiveness of implementing two alternate self-compassion exercises on individuals' levels of self-esteem, willingness to communicate, performance perceptions and post event processing following a social speech task.

There were two exercises being assessed, a compassionate writing and compassionate imagery audio task. It is expected that those whom complete either of these exercises following the speech task will benefit by feeling less self-critical of themselves, feel more positive about their performance and be more willing to take part in future social situations. This was explored by comparing these techniques to a group who were asked to think about the speech as they would normally do. It was also predicted that those who completed the imagery task would feel more benefit than those who completed the written exercise. Your data will help our understanding of the potential role for developing self-compassion in the field of social anxiety. This may lead to improved or alternative treatments for social anxiety.

Once again, results of this study will not include your name or any other identifying characteristics. The experiment did use deception, in that the main aims of the study were not made clear to you and you were not aware of the speech task until shortly beforehand. This was in order to minimise the risk of bias to the data being collected, or for the initial questionnaires to be affected by anticipatory levels of anxiety. You may have a copy of this summary if you wish, in addition to a summary of research findings once the project is completed.

If you have any further questions please contact me, Jon Richards, at j.m.richards@soton.ac.uk, or Professor Lusia Stopa at L.Stopa@soton.ac.uk.

Thank you for your participation in this research.

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Further information

Social anxiety is a normal human experience; however, some people have higher levels of anxiety around social situations than others. If you feel that it is a significant problem for you (for example, you feel that your anxiety prevents you from doing things on a regular basis), then there are several areas of support you can access:

- The university enabling services:

https://www.southampton.ac.uk/edusupport/mental_health_and_wellbeing/want-to-talk-to-someone-a.page or your GP.

- An excellent self help guide to understanding and overcoming social anxiety using cognitive behavioral therapy techniques, written by Pennine NHS Trust:

<http://www.selfhelpguides.nrw.nhs.uk/penninecare/leaflets/selfhelp/Shyness%20and%20Social%20Anxiety.pdf>

- <https://www.nhs.uk/conditions/social-anxiety/>: A good starting point for people just finding out about social anxiety and related issues. This link includes several links to enable people to access further information and forms of support.

- <https://www.steps2wellbeing.co.uk/>: The Steps to Wellbeing Service is a free, confidential, NHS service for people aged 18+, and offers a range of psychological treatments for individuals experiencing low mood and anxiety, amongst other difficulties. You can self-refer to this service or be referred by your GP.

Additionally, if you have a specific interest in accessing further information about developing self-compassion, the Compassionate Mind Foundation

(<https://compassionatemind.co.uk/>) is a fantastic resource, which includes a section of audio exercises, videos of key note speeches and links to a host of relevant books and publications .

Appendix H Social Interaction Anxiety Scale

For each item, please tick the box to indicate the degree to which you feel the statement is **characteristic or true for you**. The rating scale is as follows:

Not at all characteristic or true of me.

Slightly characteristic or true of me.

Moderately characteristic or true of me.

Very characteristic or true of me.

Extremely characteristic or true of me.

Characteristic	Not at all	Slightly	Moderately	Very	Extremely
I get nervous if I have to speak with someone in authority (teacher, boss, etc.).					
I have difficulty making eye contact with others.					
become tense if I have to talk about myself or my feelings.					
I find it difficult to mix comfortably with the people I work with.					
I find it easy to make friends my own age.					
I tense up if I meet an acquaintance in the street.					
When mixing socially, I am uncomfortable.					
I feel tense if I am alone with just one other person.					
I am at ease meeting people at parties, etc.					
I have difficulty talking with other people.					
I find it easy to think of things to talk about.					
I worry about expressing myself in case I appear awkward.					
I find it difficult to disagree with another's point of view.					
I have difficulty talking to attractive persons of the opposite sex.					
I find myself worrying that I won't know what to say in social situations.					
I am nervous mixing with people I don't know well.					
I feel I'll say something embarrassing when talking.					
When mixing in a group, I find myself worrying I will be ignored.					
I am tense mixing in a group.					
I am unsure whether to greet someone I know only slightly.					

Appendix I Post Event Processing Inventory: Trait

Please rate the extent to which you agree or disagree with the following statements by ticking the box that corresponds with each of your answer choices. **Please rate each statement with regard to how you generally think following social situations.**

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
After social events, I think about the mistakes I made during the situation.					
After social situations, I replay the event over in my mind.					
I focus on the negative aspects of social events after they occur.					
After social encounters, I think about how poorly the situation went.					
After social events, I think about other similar past situations.					
I find it difficult to forget about social events after they are over.					
I experience recurring thoughts about social events long after they are over.					
After social situations, my thoughts about the event interfere with my ability to concentrate.					
After social situations, I experience distressing thoughts about the event.					
After social situations, I become overwhelmed by my thoughts.					
I experience intrusive thoughts about social situations after the event has occurred.					
After social situations, I become preoccupied by my thoughts.					

Appendix J Post Event Processing Inventory: State

Please rate the extent to which you agree or disagree with the following statements by ticking the box that corresponds with each of your answer choices. Please rate each statement with regard to the speech exercise you completed

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I thought about the mistakes I made during the speech.					
After the speech, I kept replaying the situation over in my mind.					
I generally focused on the negative aspects of the speech after it occurred.					
I thought about how poorly the speech went.					
After the speech, I thought about other similar past situations.					
I found it difficult to forget about the speech after it was over.					
I experienced recurring thoughts about the speech long after it was over.					
My thoughts about the speech interfered with my ability to concentrate.					
After the speech was over, I experienced distressing thoughts about the situation.					
After the speech was over, I became overwhelmed by my thoughts.					
I experienced intrusive thoughts about the speech.					
When thinking about the speech, I became preoccupied by my thoughts					

Appendix K Rosenberg Self-Esteem Scale

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement by ticking the corresponding box.

	Strongly Agree	Agree	Disagree	Strongly Disagree
On the whole, I am satisfied with myself.				
At times I think I am no good at all.				
I feel that I have a number of good qualities.				
I am able to do things as well as most other people.				
I feel I do not have much to be proud of.				
I certainly feel useless at times.				
I feel that I'm a person of worth, at least on an equal plane with others.				
I wish I could have more respect for myself.				
All in all, I am inclined to feel that I am a failure				
I take a positive attitude toward myself.				

Appendix L Self-Compassion Scale

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

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

Almost never
1 **2** **3** **4** **Almost always**
5

Question	Rating
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.	

Appendix M Positive and Negative Affect Scale

This scale consists of a number of words that describe different feelings and emotions. Read each item and then tick the appropriate box to indicate to what extent you feel this way **right now**, that is, at the present moment.

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Interested					
Disinterested					
Excited					
Upset					
Strong					
Guilty					
Scared					
Hostile					
Enthusiastic					
Proud					
Irritable					
Alert					
Ashamed					
Inspired					
Nervous					
Determined					
Attentive					
Jittery					
Active					
Afraid					

Appendix N VAS Measures

PRE-Speech anxiety and performance rating scales

Using the scale below, please rate how anxious you are feeling right now

	0	10	20	30	40	50	60	70	80	90	100	
Not at all Anxious												Extremely Anxious

Using the scale below, please rate how well you think you will perform during the speech.

	0	10	20	30	40	50	60	70	80	90	100	
I will not Perform well at all												I will perform extremely well

POST-speech anxiety rating scale

Using the scale below, please rate the highest level of anxiety you felt during the speech.

	0	10	20	30	40	50	60	70	80	90	100	
Not at all Anxious												Extremely Anxious

POST-manipulation engagement rating scale

Please rate how well you feel you were able to engage in the exercise you have just completed

	0	10	20	30	40	50	60	70	80	90	100	
Not at all												Extremely

Appendix O State Self-Esteem Scale

Please read the following statements and indicate how you feel at this present moment

	Not at All	A Little Bit	Somewhat	Very Much	Extremely
I feel confident about my abilities.					
I am worried about whether I am regarded as a success or failure.					
I feel frustrated or rattled about my performance					
I feel self-conscious.					
I feel as smart as others.					
I feel displeased with myself.					
I am worried about what other people think of me.					
I feel confident that I understand things.					
I feel inferior to others at this moment.					
I feel concerned about the impression I am making.					
I feel that I have less scholastic ability right now than others.					
I feel like I'm not doing well.					
I am worried about looking foolish.					

Appendix P State Self-Compassion Scale

Please indicate how you are responding RIGHT NOW following the speech you just completed using the following scale.

	Not at all	Slightly	Moderately	Mostly	Completely
Right now, I disapprove of and judge my own flaws and inadequacies.					
Right now, I am obsessing and fixating on everything that's wrong.					
I see the stress I just experienced as part of life that everyone goes through.					
Thinking about my inadequacies during my performance makes me feel more separate and cut off from the rest of the world.					
I'm trying to be loving towards myself following my performance.					
Following my performance, I have become consumed by feelings of inadequacy.					
I am reminding myself that there are lots of other people in the world feeling like I am.					
In response to my performance, I am being tough on myself.					
Right now, I am trying to keep my emotions in balance.					
I'm trying to remind myself that feelings of inadequacy are shared by most people.					
I feel intolerant and impatient towards those aspects of my personality I don't like that came out in the performance.					
I am giving myself the caring and tenderness I need right now.					
Right now, I feel like most other people are probably happier than I am.					
Following my performance, I am trying to take a balanced view of the situation.					

Right now, I'm trying to see my failings as part of the human condition					
When I think about aspects of myself that I didn't like during the performance, I feel down about myself.					
Right now, I am trying to keep things in perspective.					
I feel like other people who completed the performance are having an easier time of it.					
Right now, I am trying to be kind to myself.					
Right now, I am getting carried away with my feelings.					
Right now, I feel a bit cold-hearted towards myself.					
Right now, I'm trying to approach my feelings with curiosity and openness.					
Right now, I feel tolerant of my own flaws and inadequacies.					
Right now, I am blowing my performance out of proportion.					
Following the performance, I am trying to be understanding and patient towards those aspects of my personality I don't like.					
Right now, I feel alone in my failure					

Appendix Q Performance Rating Form

Please rate yourself on the features listed below. For each feature, please tick the appropriate box for how you felt you actually performed during the speech exercise. Please answer as honestly as you can.

	Not at all	Slightly	Moderately	Much	Very much
Content was understandable					
Kept eye contact with audience					
Stuttered					
Had long pauses (more than 5 seconds)					
Fidgeted					
“Um”ed and “Ah”ed					
Had a clear voice					
Seemed to tremble or shake					
Sweated					
Blushed					
Face twitched					
Voice quivered					
Appeared confident					
Appeared nervous					
Kept audience interested					
Generally spoke well					
Made a good impression					

Appendix R Willingness to Communicate Scale

Below are 20 situations in which a person might choose to communicate or not to communicate. Presume you have completely free choice. Indicate the percentage of times you would choose to communicate in each type of situation. Indicate in the space at the left of the item what percent of the time you would choose to communicate. (0 = Never to 100 = Always)

- _____ 1. Talk with a service station attendant.
- _____ 2. Talk with a doctor.
- _____ 3. Present a talk to a group of strangers.
- _____ 4. Talk with an acquaintance while standing in line.
- _____ 5. Talk with a salesperson in a store.
- _____ 6. Talk in a large meeting of friends.
- _____ 7. Talk with a police officer.
- _____ 8. Talk in a small group of strangers.
- _____ 9. Talk with a friend while standing in line.
- _____ 10. Talk with a waiter/waitress in a restaurant.
- _____ 11. Talk in a large meeting of acquaintances.
- _____ 12. Talk with a stranger while standing in line.
- _____ 13. Talk with a receptionist.
- _____ 14. Present a talk to a group of friends.
- _____ 15. Talk in a small group of acquaintances.
- _____ 16. Talk with a rubbish/waste collector.
- _____ 17. Talk in a large meeting of strangers.
- _____ 18. Talk with a spouse (or girl/boyfriend).
- _____ 19. Talk in a small group of friends.
- _____ 20. Present a talk to a group of acquaintances

Appendix S Speech Exercise Brief

For the next phase of the study, we would like you to give a brief speech. You can choose one out of the two topics below.

Topic 1) Briefly outline your ideal job and describe why you would be suited for it.

Topic 2) Describe the personal qualities and behaviours that make you a good friend.

You will have **2 minutes** to initially prepare for the speech, which will then last for **3 minutes**. If you run out of things to say before the 3 minutes elapse, please **repeat** some of the information you have already provided until you run out of time.

Please **stand and address the camera when giving this speech**, as judges who are expert in communication will be evaluating your speech performance in areas such as communicative ability, general employability and genuineness.

Please feel free to ask any questions you might have. Please note, you may withdraw from this exercise, and consequently the remainder of the study at any time. Please be aware that if you were to withdraw, you would no longer be eligible to receive student credit or monetary payment.

If you are happy to complete this exercise, please complete the secondary consent form provided.

Appendix T Compassionate Letter Writing Exercise

We are interested in the way that people respond to giving a speech. **What you write down will not be evaluated.**

- 1) We would like you to briefly think about your speech and how you feel you performed. Try to notice if you are holding any negative feelings or thoughts following this speech. Please take around a minute to think about these.
- 2) Now, take a few moments to engage in some slow, deep breathing. Close your eyes if you feel comfortable and try to slow down and deepen your breathing. Settle into a rhythm that for you feels comfortable. Focus your attention on the sense of slowing down the body and slowing down the mind. Practice this for around a minute.
- 3) Now try to connect with that part of you that is kind and understanding of others. Think of someone who you really cherish and hold them in mind – they can be family, a close friend or a partner, or anyone important to you.

Think about the love, kindness and compassion that you feel for this person, and reflect on how this feels in your body for a moment.

Think about what you would say to this person if they were in your position, and the kindness and compassion you would direct towards them.

Now try to take a moment to notice this person directing this warmth, kindness and compassion towards **you**. Think about what this person would say to **you** in this situation.

- 4) Write a short letter to yourself **from the perspective of this person**. This letter may take about 10 minutes to write, and there is no right or wrong way of doing it. In this, try to have an understanding of any distress you may feel (e.g. I am sad you feel distressed...) and recognise that your distress makes sense.

Think about how if this person was aware of all of your strengths and all your weaknesses, what would they write in order to remind you that you are only human, that all people experience difficult times and have their own areas of strength and weakness?

What would they write to remind you of your particular strengths? Write down what this person feels towards you, loving and accepting you exactly as you are. Try to infuse your letter with a strong sense of this person's acceptance, kindness, caring, and desire for your health and happiness.

Write whatever comes to you, but make sure the letter provides you with what you think you need to hear in order to feel nurtured and soothed at this moment. Try and be good to yourself in spite of any disappointments you may hold. After writing the letter, re-read it again, really letting the words sink in. Notice how you feel.

Appendix U Compassionate Self Imagery Exercise Transcript

Now that you are sitting comfortably, place both feet flat on the floor about shoulder's width apart and rest your hands on your legs. Close your eyes, or look down at the floor if you prefer. Allow yourself to have a gentle facial expression, maybe a slight smile.

Now just gently focus on your breathing. As you breathe try to allow the air to come down into your diaphragm. Feel your stomach, move as you breathe in and out. Breathe a little faster or a little slower until you find a breathing pattern that, for you, seems to be your own soothing, comforting rhythm. It is like you are checking in, linking up with the rhythm within your body that is soothing and calming to you.... What you will usually find is that your breathing is slightly slower and deeper than normal. The inbreath is about 3 seconds ... hold ... and then take 3 seconds for the out-breath. Gradually allowing the breath to lengthen and slow down, with a long even breath in...and a long even outbreath.....

Now turn your attention to your body. Sense the weight of your body resting on the chair and the floor underneath you.... allow yourself to feel held and supported.....coming to rest in the present moment.... remember that it is perfectly ok for your mind to wander. Simply notice it happening with curiosity, and then gently guide your attention back to an awareness of your body as best as you can. Now, just sense the flow of air coming in and out of your nostrils....just gently observing....no need to change anything.....just allowing things to be as they are.

When you're ready, try to create a place in your mind that could give you the feeling of safeness and calmness....Imagine looking around you, what can you see? It might be a beautiful wood where the leaves of the trees dance gently in the breeze, powerful shafts of light caress the ground with brightness. Or it may be a beautiful beach with a crystal blue sea stretching out to the horizon where it meets the ice blue sky.... Or relaxing next to an open fire....take some time to visualise your space.....Now focus on what you can feel, like the sensation of the sun on your face or a breeze caressing your hair.... Or can you feel soft, white sand underfoot..... Next think about what you can hear. Can you hear the rustle of the leaves on the trees, or birds, or the gentle hushing of waves on the sand?..... Now think about whether you can smell anything, such as the salty smell of the sea or the smell of wood smoke or a sweetness of the air.... Take a few moments to immerse yourself in your own place of calmness and safety.....

When you bring your safe place to mind allow your body to relax. Think about your facial expression; allow it to have a soft smile of pleasure at being there.... Imagine that, the place itself takes joy in you being here.... Explore your feelings when you imagine this place is happy with you being there.... Even if it is just a fleeting sense of where the image might be, try to create an emotional connection to this place.

And sitting across from you in this place just a small distance, you can see a version of yourself that is an embodiment of compassion and warmth.....and in observing this compassionate version of yourself, notice how it is sitting with a strong posture and

presence, that shows a strength and resilience that is able to tolerate great difficulty and discomfort..... observe how your compassionate self also appears very wise...it shows a calmness and can see things clearly... it understands how we've evolved over hundreds of millions of years, knowing that our brains, our bodies and our minds on all sorts of dimensions we didn't choose, we didn't ask for...so much that we have learned is not what we would choose, and so much that pains us and troubles us in life is really not our fault...and in observing your compassionate self, you can see that it is fully committed...there is nothing in the world as important as the alleviation and prevention of your suffering.... your compassionate self is completely committed to your wellbeing... ..and resting for a moment, you are allowing your eyes to meet the eyes of this compassionate version of you...noticing the health, vitality and wellbeing present in the skin and the eyes...just noticing a warm, smiling expression.... seeing the deep care and connectedness that is there...the warmth, and real presence...whenever your mind wanders away from this practice just breathe in and bringing your attention back to this connection with this compassionate self...

And imagining that you can bring the awareness of this compassionate self into you, just as you might pour cool clear water from a pitcher into a clear glass...just from the top of your head as you inhale, breathing in the presence of this compassionate self...and feeling yourself being filled by this presence up from the soles of your feet, through the legs and lower body...with each cycle of the breath becoming this compassionate body...all the way to the top of the head...letting go of any wondering or worrying about if we really are this compassionate self...just imagining what it would be like...how we would want our face to have the expression of this compassionate being, the body posture...

Now imagining in a friendly tone of voice, in a caring tone of voice, a strong and authoritative tone of voice...imagining in your mind seeing and hearing your compassionate self say these words...may I be filled with love and kindness and compassion...may I be peaceful and at ease...may I be well...may I be happy...may I be filled with love and kindness and compassion...may the conditions that have caused my suffering be let go, and may I be well...may even the parts in me that resist compassion, the parts in me that cling to suffering, may even those parts come to be at ease, at rest....may I be present and aware...may I be awake and wise..

...taking this time just to rest in the breath, in the presence of this compassionate self...just imagining what it would look like if you were moving through your day as this compassionate self, imagining taking action to care for, look after specific people you might meet...imagine caring for yourself, promoting your own wellbeing... ..And gradually with each exhalation just letting go of the images and resting of the breath, feeling your feet on the ground. And bringing a part of your attention to the top of your head...and breathing awareness into your body, awareness of your presence in the room...and as you breath in noticing the sounds around you in the room...now listening to the chimes three times, giving yourself some credit for engaging in this practice...remembering your motivation to be aware of the suffering you notice in yourself and others, and move towards the alleviation and prevention of that suffering so that you may wake up, be present, in peace.

Appendix V Control Exercise Instructions

We are interested in the way that people respond to giving a speech. **What you write down will not be evaluated.**

We would like you now you to think about your speech performance in the way you normally would and then write down your thoughts.

- 1) Please spend 5 minutes thinking about your performance of the speech and how you feel about yourself now.
- 2) Then write everything you thought about below. Please spend around 5 minutes writing these thoughts down.

Appendix W Summary of Reported Ethnicities of Participants.

Ethnicity	Frequency	Percentage
White British	42	51.2
Any Other White Background	17	20.7
Any Other Mixed Background	4	4.9
Any Other Asian Background	3	3.7
Chinese	3	3.7
Asian - Pakistani	3	3.7
Black or Black British - African	2	2.4
Mixed – White and Black Caribbean	2	2.4
Any Other Ethnic Group	2	2.4
Asian – Indian	1	1.2
Black or Black British - Caribbean	1	1.2
Mixed – White and Asian	1	1.2

Appendix X Mean and Statistical Differences Between Dependent Variables Following Condition (Non-Engagers Removed).

Construct (measure)	Compassionate Imagery Mean (SD) <i>n</i> = 25	Compassionate Writing Mean (SD) <i>n</i> = 26	Control Mean (SD) <i>n</i> = 26	<i>F</i>	<i>p</i>	η^2
State self-esteem (S-SES)	43.80 (9.86)	40.58 (8.40)	30.81 (9.91)	13.273	.000	.264
Positive affect post condition (PANAS)	27.64 (7.39)	26.08 (8.21)	21.15 (6.20)	5.503	.006	.129
Negative affect post condition (PANAS)	11.88 (2.43)	15.38 (4.02)	22.85 (7.34)	31.402	.000	.459
Willingness to communicate (WTC)	42.23 (14.00)	37.70 (12.38)	38.21 (15.04)	.814	.447	.022
Post speech performance rating (PRF)	31.56 (9.49)	31.31 (6.49)	25.19 (9.03)	4.728	.12	.113
State post event processing (PEPI-S)	22.72 (12.01)	22.88 (5.92)	30.23 (9.32)	5.400	.006	.127
Construct (measure)	Imagery – Control <i>p</i> =	Writing – Control <i>p</i> =	Imagery – Writing <i>p</i> =			
State self-esteem (S-SES)	< .001	.001	.444			
Positive affect post condition (PANAS)	.006	.046	.727			
Negative affect post condition (PANAS)	< .001	< .001	.046			
Willingness to communicate (WTC)	.557	.990	.475			
Post speech performance rating (PRF)	.023	.029	.994			
State post event processing (PEPI-S)	.015	.017*	.998			

List of References

- Abbott, M. J., & Rapee, R. M. (2004). Post-Event Rumination and Negative Self-Appraisal in Social Phobia before and after Treatment. *Journal of Abnormal Psychology, 113*(1), 136–144. <https://doi.org/10.1037/0021-843X.113.1.136>
- Aldao, A., Gee, D. G., De Los Reyes, A., & Seager, I. (2016). Emotion regulation as a transdiagnostic factor in the development of internalizing and externalizing psychopathology: Current and future directions. *Development and Psychopathology, 28*(4), 927–946. <https://doi.org/10.1017/S0954579416000638>
- Aldao, A., Mennin, D. S., & McLaughlin, K. A. (2013). Differentiating Worry and Rumination: Evidence from Heart Rate Variability During Spontaneous Regulation. *Cognitive therapy and research, 37*(3), 613–619. <https://doi.org/10.1007/s10608-012-9485-0>
- Allen, N. B., & Knight, W. (2005). Mindfulness, compassion for self, and compassion for others. In P. Gilbert (Ed.), *Compassion: Conceptualizations, research and use in psychotherapy* (pp. 239–262). New York: Routledge.
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*. Arlington, VA.
- Arditte, K. A., Shaw, A. M., & Timpano, K. R. (2016). Repetitive Negative Thinking : A Transdiagnostic Correlate of Affective Disorders, *Journal of Social and Clinical Psychology, 35*(3), 181–201. <https://doi.org/10.1521/jscp.2016.35.3.181>
- Arch, J. J., Brown, K. W., Dean, D. J., Landy, L. N., Brown, K. D., & Laudenslager, M. L. (2014). Self-compassion training modulates alpha-amylase, heart rate variability, and subjective responses to social evaluative threat in women. *Psychoneuroendocrinology, 42*, 49–58. <https://doi.org/10.1016/j.psyneuen.2013.12.018>
- Arch, J. J., Landy, L. N., Schneider, R. L., Koban, L., & Andrews-Hanna, J. R. (2018). Self-compassion induction enhances recovery from social stressors: Comparing adults with

- social anxiety disorder and healthy controls. *Anxiety, Stress and Coping*, 31(5), 594–609.
<https://doi.org/10.1080/10615806.2018.1504033>
- Armijo-Olivo, S., Warren, S., & Magee, D. (2009). Intention to treat analysis, compliance, drop-outs and how to deal with missing data in clinical research: a review. *Physical Therapy Reviews*, 14(1), 36–49. <https://doi.org/10.1179/174328809X405928>
- Armstrong, L., & Rimes, K. A. (2016). Mindfulness-Based Cognitive Therapy for Neuroticism (Stress Vulnerability): A Pilot Randomized Study. *Behavior Therapy*, 47(3), 287–298.
<https://doi.org/10.1016/j.beth.2015.12.005>
- Barlow, D. H., Farchione, T. J., Fairholme, C. P., Ellard, K. K., Boisseau, C. L., Allen, L. B., & Ehrenreich-May, J. (2011). *The unified protocol for transdiagnostic treatment of emotional disorders: Therapist guide*. New York: Oxford University Press.
- Barnard, L. K., & Curry, J. F. (2011). Self-Compassion: Conceptualizations, Correlates, & Interventions. *Review of General Psychology*, 15(4), 289–303.
<https://doi.org/10.1037/a0025754>
- Beck, A.T. (2008). The evolution of the cognitive model of depression and its neurobiological correlates. *American Journal of Psychiatry*, 165, 969-977.
<https://doi.org/10.1176/appi.ajp.2008.08050721>
- Blackie, R. A., & Kocovski, N. L. (2016). Letting go of yesterday: Effect of distraction on post-event processing and anticipatory anxiety in a socially anxious sample, *Cognitive Behaviour Therapy*, 45(1), 60-72. <https://doi.org/10.1080/16506073.2015.1104383>
- Blackie, R. A., & Kocovski, N. L. (2017). Development and validation of the trait and state versions of the Post-Event Processing Inventory. *Anxiety, Stress and Coping*, 30(2), 202–218. <https://doi.org/10.1080/10615806.2016.1230668>
- Blackie, R. A., & Kocovski, N. L. (2018a). Examining the Relationships Among Self-Compassion, Social Anxiety, and Post-Event Processing. *Psychological Reports*, 121(4), 669–689. <https://doi.org/10.1177/0033294117740138>

- Blackie, R. A., & Kocovski, N. L. (2018b). Forgive and let go: Effect of self-compassion on post-event processing in social anxiety. *Mindfulness*, *9*(2), 654–663.
<https://doi.org/10.1007/s12671-017-0808-9>
- Boersma, K., Håkanson, A., Salomonsson, E., & Johansson, I. (2015). Compassion Focused Therapy to Counteract Shame, Self-Criticism and Isolation. A Replicated Single Case Experimental Study for Individuals with Social Anxiety. *Journal of Contemporary Psychotherapy*, *45*(2), 89–98. <https://doi.org/10.1007/s10879-014-9286-8>
- Borkovec, T. D., Ray, W. J., & Stöber, J. (1998). Worry: A cognitive phenomenon intimately linked to affective, physiological, and interpersonal behavioral processes. *Cognitive Therapy and Research*, *22*(6), 561-576. <https://doi.org/10.1023/A:1018790003416>
- Borkovec, T. D., Robinson, E., Pruzinsky, T., & DePree, J. A. (1983). Preliminary exploration of worry: Some characteristics and processes. *Behaviour Research and Therapy*, *21*, 9–16.
[https://doi.org/10.1016/0005-7967\(83\)90121-3](https://doi.org/10.1016/0005-7967(83)90121-3)
- Brenner, R. E., Heath, P. J., Vogel, D. L., & Credé, M. (2017). Two is more valid than one: Examining the factor structure of the Self-Compassion Scale (SCS). *Journal of Counseling Psychology*, *64*(6), 696-707. <https://doi.org/10.1037/cou0000211>
- Brosschot, J. F., Van Dijk, E., & Thayer, J. F. (2007). Daily worry is related to low heart rate variability during waking and the subsequent nocturnal sleep period. *International Journal of Psychophysiology*, *63*(1), 39–47. <https://doi.org/10.1016/j.ijpsycho.2006.07.016>
- Brown, T. A., Antony, M. M., & Barlow, D. H. (1992). Psychometric properties of the Penn State Worry Questionnaire in a clinical anxiety disorders sample. *Behaviour research and therapy*, *30*(1), 33–37. [https://doi.org/10.1016/0005-7967\(92\)90093-v](https://doi.org/10.1016/0005-7967(92)90093-v)
- Butz, S., & Stahlberg, D. (2018). Can self-compassion improve sleep quality via reduced rumination? *Self and Identity*, *17*(6), 666–686.
<https://doi.org/10.1080/15298868.2018.1456482>

- Țânda, D. M., & Szentágotai-Tátar, A. (2017). Shame as a predictor of post-event rumination in social anxiety. *Cognition and Emotion*, *31*(8), 1684–1691.
<https://doi.org/10.1080/02699931.2016.1243518>
- Cassin, S. E., & Rector, N. A. (2011). Mindfulness and the Attenuation of Post-Event Processing in Social Phobia: An Experimental Investigation. *Cognitive Behaviour Therapy*, *40*(4), 267–278. <https://doi.org/10.1080/16506073.2011.614275>
- Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In R. G. Heimberg., M. R. Liebowitz., D. A. Hope., & F. R. Schneier. (Eds.), *Social Phobia: diagnosis, assessment and treatment* (pp. 69–93). New York: Guilford Press.
- Conway, M. A., & Pleydell-Pearce, C. W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review*, *107*, 261-288.
<http://dx.doi.org/10.1037/0033-295X.107.2.261>
- Cooper, M. J. (2012). Cognitive behavioural models in eating disorders. In J.R.E. Fox & K. Goss (Eds.), *Eating and its disorders* (pp.204-224). Oxford, England: Wiley-Blackwell
- Costa, V. D., Lang, P. J., Sabatinelli, D., Versace, F., & Bradley, M. M. (2010). Emotional imagery: assessing pleasure and arousal in the brain's reward circuitry. *Human brain mapping*, *31*(9), 1446–1457. <https://doi.org/10.1002/hbm.20948>
- Cox, B. J., Fleet, C., & Stein, M. B. (2004). Self-criticism and social phobia in the US national comorbidity survey. *Journal of Affective Disorders*, *82*(2), 227–234.
<https://doi.org/10.1016/j.jad.2003.12.012>
- Dalai Lama (1995). *The Power of Compassion*. Delhi: Harper Collins.
- Dannahy, L., & Stopa, L. (2007). Post-event processing in social anxiety. *Behaviour Research and Therapy*, *45*(6), 1207–1219. <https://doi.org/10.1016/j.brat.2006.08.017>
- Dumville, J. C., Torgerson, D. J., & Hewitt, C. E. (2006). Reporting attrition in randomised controlled trials. *BMJ (Clinical research ed.)*, *332*(7547), 969–971.
<https://doi.org/10.1136/bmj.332.7547.969>

- Dundas, I., Binder, P. E., Hansen, T. G. B., & Stige, S. H. (2017). Does a short self-compassion intervention for students increase healthy self-regulation? A randomized control trial. *Scandinavian Journal of Psychology*, 58(5), 443–450. <https://doi.org/10.1111/sjop.12385>
- Egan, S. J., Wade, T. D., & Shafran, R. (2011). Perfectionism as a Transdiagnostic Process: A Clinical Review. *Clinical Psychology Review*, 31, 203-212. <https://doi.org/10.1016/j.cpr.2010.04.009>
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behavior Research and Therapy*, 38, 319–345. [https://doi.org/10.1016/S0005-7967\(99\)00123-0](https://doi.org/10.1016/S0005-7967(99)00123-0)
- Ehring, T., Frank, S., & Ehlers, A. (2008). The Role of Rumination and Reduced Concreteness in the Maintenance of Posttraumatic Stress Disorder and Depression Following Trauma. *Cognitive therapy and research*, 32(4), 488–506. <https://doi.org/10.1007/s10608-006-9089-7>
- Ehring, T., & Watkins, E. R. (2008). Repetitive Negative Thinking as a Transdiagnostic Process, *International Journal of Cognitive Therapy*, 1(3), 192–205. <https://doi.org/10.1680/ijct.2008.1.3.192>
- Erdur-Baker, Ö., & Bugay, A. (2010). The short version of ruminative response scale: Reliability, validity and its relation to psychological symptoms. *Procedia-Social and Behavioral Sciences*, 5, 2178–2181. <https://doi.org/10.1016/j.sbspro.2010.07.433>
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191. <https://doi.org/10.3758/BF03193146>
- Fehm, L., Pelissolo, A., Furmark, T., & Wittchen, H. U. (2005). Size and burden of social phobia in Europe. *European Neuropsychopharmacology*, 15(4), 453–462. <https://doi.org/10.1016/j.euroneuro.2005.04.002>
- Feinman, R.D. (2009). Intention-to-treat. What is the question? *Nutrition and Metabolism*, 6, (1). <https://doi.org/10.1186/1743-7075-6-1>

- Ferrari, M., Hunt, C., Harrysunker, A., Abbott, M. J., Beath, A. P., & Einstein, D. A. (2019). Self-Compassion Interventions and Psychosocial Outcomes: A Meta-Analysis of RCTs. *Mindfulness*, 1455–1473. <https://doi.org/10.1007/s12671-019-01134-6>
- Field, A. (2018). *Discovering Statistics Using SPSS* (5th ed.). London: Sage.
- Finlay-Jones, A., Xie, Q., Huang, X., Ma, X., & Guo, X. (2018). A Pilot Study of the 8-Week Mindful Self-Compassion Training Program in a Chinese Community Sample. *Mindfulness*, 9(3), 993–1002. <https://doi.org/10.1007/s12671-017-0838-3>
- Franco, A., Malhotra, N., & Simonovits, G. (2014). Publication bias in the social sciences: Unlocking the file drawer. *Science*, 345(6203), 1502–1505. <https://doi.org/10.1126/science.1255484>
- Fresco, D. M., Heimberg, R. G., Mennin, D. S., & Turk, C. L. (2002). Confirmatory factor analysis of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*, 40(3), 313–323. [https://doi.org/10.1016/S0005-7967\(00\)00113-3](https://doi.org/10.1016/S0005-7967(00)00113-3)
- Fresnics, A., & Borders, A. (2017). Angry rumination mediates the unique associations between self-compassion and anger and aggression. *Mindfulness*, 8(3), 554–564. <https://doi.org/10.1007/s12671-016-0629-2>
- 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 Depression, Anxiety, and Stress. *Frontiers in Psychology*, 10(May), 1–11. <https://doi.org/10.3389/fpsyg.2019.01099>
- Garland, E. L., & Howard, M. O. (2014). A Transdiagnostic Perspective on Cognitive, Affective, and Neurobiological Processes Underlying Human Suffering. *Research on Social Work Practice*, 24(1), 142–151. <https://doi.org/10.1177/1049731513503909>
- Gilbert, P. (2009). *The Compassionate Mind*. London, UK: Constable & Robinson.
- Gilbert, P. (2014a). The origins and nature of compassion focused therapy. *British Journal of Clinical Psychology*, 53(1), 6–41. <https://doi.org/10.1111/bjc.12043>

- Gilbert, P. (2014b). Evolutionary models. Practical and conceptual utility for the treatment and study of social anxiety disorder. In J. W. Weeks (Ed.), *The Wiley Blackwell handbook of social anxiety disorder* (pp. 24–52). Chichester, UK: Wiley.
- Gilbert, P. (2017). *Compassion: Concepts, Research and Applications*, New York, NY: Routledge.
- Gilbert, P., Catarino, F., Duarte, C., Matos, M., Kolts, R., Stubbs, J., ... Basran, J. (2017). The development of compassionate engagement and action scales for self and others. *Journal of Compassionate Health Care*, 4(1), 1–24. <https://doi.org/10.1186/s40639-017-0033-3>
- Gilbert, P., & Irons, C. (2004). A pilot exploration of the use of compassionate images in a group of self-critical people. *Memory*, 12(4), 507–516. <https://doi.org/10.1080/09658210444000115>
- Gilbert, P., McEwan, K., Matos, M. & Ravis, A. (2011). Fears of compassion: Development of three self-report measures. *Psychology and Psychotherapy: Theory, Research and Practice*, 84, 239-255. <https://doi.org/10.1348/147608310X526511>
- Gilbert, P., & Woodyatt, L. (2017). An evolutionary approach to shame-based self-criticism, self-forgiveness, and compassion. In L. Woodyatt, E. L. J. Worthington, M. Wenzel, & B. J. Griffin (Eds.), *Handbook of the psychology of self-forgiveness*. (pp. 29–41). United Kingdom: Springer International Publishing.
- Graser, J., Höfling, V., Weßlau, C., Mendes, A., & Stangier, U. (2016). Effects of a 12-week mindfulness, compassion, and loving kindness program on chronic depression: A pilot within-subjects wait-list controlled trial. *Journal of Cognitive Psychotherapy*, 30(1), 35–49. <https://doi.org/10.1891/0889-8391.30.1.35>
- Gu, J., Baer, R., Cavanagh, K., Kuyken, W., & Strauss, C. (2020). Development and Psychometric Properties of the Sussex-Oxford Compassion Scales (SOCS). *Assessment*, 27(1), 3–20. <https://doi.org/10.1177/1073191119860911>

- Jackman, A., Clark, D. M., & McManus, F. (2000). Recurrent images and early memories in social phobia. *Behaviour Research and Therapy*, *38*, 601–610.
[https://doi.org/10.1016/S0005-7967\(99\)00161-8](https://doi.org/10.1016/S0005-7967(99)00161-8)
- Jarwood, E. M., & Kocovski, N. L. (2017). Self-Compassion Induction Reduces Anticipatory Anxiety Among Socially Anxious Students. *Mindfulness*, *8*(6), 1544–1551.
<https://doi.org/10.1007/s12671-017-0721-2>
- Heimberg, R. G., Brozovich, F. A., & Rapee, R. M. (2010). A cognitive behavioral model of social anxiety disorder: Update and extension. In S. G. Hofmann & P.M. DiBartolo (Eds.), *Social anxiety: Clinical, developmental, and social perspectives* (2nd ed., pp. 395–422). New York, NY: Academic Press.
- Heimberg, R. G., Mueller, G. P., Holt, C. S., Hope, D. A., & Liebowitz, M. R. (1992). Assessment of anxiety in social interaction and being observed by others: The social interaction anxiety scale and the Social Phobia Scale. *Behavior Therapy*, *23*(1), 53–73.
[https://doi.org/10.1016/S0005-7894\(05\)80308-9](https://doi.org/10.1016/S0005-7894(05)80308-9)
- Heimberg, R. G., & Turk, C. L. (2002). Assessment of social phobia. In R. G. Heimberg & R. E. Becker, *Cognitive– behavioral group therapy for social phobia: Basic mechanisms and clinical strategies* (pp. 107– 126). New York: Guilford Press.
- Leatherton, T. F., & Polivy, J. (1991). Development and validation of a scale for measuring state self- esteem. *Journal of Personality and Social Psychology*, *60*(6), 895–910.
<https://doi.org/10.1037/0022-3514.60.6.895>
- Higgins, J. P., Altman, D. G., Gøtzsche, P. C., Jüni, P., Moher, D., Oxman, A. D., & Sterne, J. A. (2011). The Cochrane Collaboration’s tool for assessing risk of bias in randomised trials. *Bmj*, *343*, d5928. <https://doi.org/10.1136/bmj.d5928>
- Henrichsen, H., & Clark, D. M. (2003). Anticipatory processing in social anxiety: two pilot studies. *Journal of Behavior Therapy and Experimental Psychiatry*, *34*, 205–218.
[https://doi.org/10.1016/S0005-7916\(03\)00050-8](https://doi.org/10.1016/S0005-7916(03)00050-8)

- Hirsch, C. R., Clark, D. M., Mathews, A., & Williams, R. (2003). Self-images play a causal role in social phobia. *Behaviour Research and Therapy*, *41*(8), 909-921.
[http://dx.doi.org/10.1016/S0005-7967\(02\)00103-1](http://dx.doi.org/10.1016/S0005-7967(02)00103-1)
- Hirsch, C. R., Meynen, T., & Clark, D. M. (2004). Negative self-imagery in social anxiety contaminates social interactions. *Memory*, *12*(4), 496-506.
<https://doi.org/10.1080/09658210444000106>
- Hofmann S. G. (2007). Cognitive factors that maintain social anxiety disorder: a comprehensive model and its treatment implications. *Cognitive behaviour therapy*, *36*(4), 193-209.
<https://doi.org/10.1080/16506070701421313>
- Hofmann, S. G., Grossman, P., & Hinton, D. E. (2011). Loving-kindness and compassion meditation: potential for psychological interventions. *Clinical psychology review*, *31*(7), 1126-1132. <https://doi.org/10.1016/j.cpr.2011.07.003>
- Hofmann, S. G., & Hayes, S. C. (2019). The Future of Intervention Science: Process-Based Therapy. *Clinical Psychological Science*, *7*(1), 37-50.
<https://doi.org/10.1177/2167702618772296>
- Hofmann, S. G., Petrocchi, N., Steinberg, J., Lin, M., Arimitsu, K., Kind, S., Mendes, A., Stangier, U. (2015). Loving-Kindness Meditation to Target Affect in Mood Disorders: A Proof-of-Concept Study. *Evidenced-Based Complementary and Alternative Medicine*, 269126. <https://doi.org/10.1155/2015/269126>
- Hoge, E. A., Hölzel, B. K., Marques, L., Metcalf, C. A., Brach, N., Lazar, S. W., & Simon, N. M. (2013). Mindfulness and self-compassion in generalized anxiety disorder: examining predictors of disability. *Evidence-Based Complementary and Alternative Medicine*, 576258. <https://doi.org/10.1155/2013/576258>
- Holman, L., Head, M. L., Lanfear, R., & Jennions, M. D. (2015). Evidence of Experimental Bias in the Life Sciences: Why We Need Blind Data Recording. *PLoS biology*, *13*(7), e1002190. <https://doi.org/10.1371/journal.pbio.1002190>

- Holmes, E. A., Brewin, C. R., & Hennessy, R. G. (2004). Trauma films, information processing, and intrusive memory development. *Journal of Experimental Psychology: General*, *133*(1), 3–22. <https://doi.org/10.1037/0096-3445.133.1.3>
- Holmes, E. A., & Mathews, A. (2010). Mental imagery in emotion and emotional disorders. *Clinical Psychology Review*, *30*(3), 349–362. <https://doi.org/10.1016/j.cpr.2010.01.001>
- Jung, M., Bounsanga, J., & Voss, M. W. (2017). Interpretation of correlations in clinical research. *Postgraduate medicine*, *129*(8), 902–906. <https://doi.org/10.1080/00325481.2017.1383820>
- Kessler, T., Cuthbert, B., Garvey, M., Heinssen, R., Kozak, M. J., Pine, D. S., Quinn, K., Sanislow, C. A., & Wang, P. W. (2010). Research Domain Criteria (RDoC): Developing a valid diagnostic framework for research on mental disorders. *American Journal of Psychiatry*, *167*(7), 748–751. <https://doi.org/10.1176/appi.ajp.2010.09091379>
- Kjaer, J. C., Ovesen, C., Winkel, P., Hilden, J., Gluud, C., & Wetterslev, J. (2019). Power estimations for non-primary outcomes in randomised clinical trials. *BMJ Open*, *9*(6), 2018–2020. <https://doi.org/10.1136/bmjopen-2018-027092>
- Kazraei, H., McGonigal, K., Jinpa, T., Doty, J. R., Gross, J. J., & Goldin, P. R. (2014). A randomized controlled trial of compassion cultivation training: Effects on mindfulness, affect, and emotion regulation. *Motivation and Emotion*, *38*(1), 23–35. <https://doi.org/10.1007/s11031-013-9368-z>
- Kazraei, H., Jinpa, T. G., McGonigal, K., Rosenberg, E., Finkelstein, J., Simon-Thomas, E., & Goldin, P. R. (2012). Enhancing compassion: A randomized controlled trial of a compassion cultivation training program. *Journal of Happiness Studies*, *14*, 1113–1126. <https://doi.org/10.1007/s10902-012-9373-z>
- Johnson, E. A., & O'Brien, K. A. (2013). Self-compassion soothes the savage ego-threat system: Effects on negative affect, shame, rumination, and depressive symptoms. *Journal of Social and Clinical Psychology*, *32*(9), 939–963. <https://doi.org/10.1521/jscp.2013.32.9.939>

- Kirby, J. N. (2017). Compassion interventions: The programmes, the evidence, and implications for research and practice. *Psychology and Psychotherapy: Theory, Research and Practice*, *90*(3), 432–455. <https://doi.org/10.1111/papt.12104>
- Kirby, J. N., Doty, J. R., Petrocchi, N., & Gilbert, P. (2017). The current and future role of heart rate variability for assessing and training compassion. *Frontiers in Public Health*, *5*, 1–6. <https://doi.org/10.3389/fpubh.2017.00040>
- Kirkpatrick, K. L. (2006). *Enhancing self-compassion using a Gestalt two-chair intervention*. (Doctoral dissertation). The University of Texas, Austin, USA. Retrieved from. <https://repositories.lib.utexas.edu/bitstream/handle/2152/1966/kirkpatrickd27295.pdf?sequence=2&isAllowed=y>
- Kmet, L. M., Lee R. C., & Cook, L. S. (2004). *Standard quality assessment criteria for evaluating primary research papers from a variety of fields*. Alberta: Alberta Heritage Foundation for Medical Research.
- Kocovski, N. L., & Rector, N. A. (2008). Post-event processing in social anxiety disorder: Idiosyncratic priming in the course of CBT. *Cognitive Therapy and Research*, *32*, 23–36. <https://doi.org/10.1007/s10608-007-9152-z>
- Koo, T. K., & Li, M. Y. (2016). A Guideline of Selecting and Reporting Intraclass Correlation Coefficients for Reliability Research. *Journal of chiropractic medicine*, *15*(2), 155–163. <https://doi.org/10.1016/j.jcm.2016.02.012>
- Koyuncu, A., İnce, E., Ertekin, E., & Tükel, R. (2019). Comorbidity in social anxiety disorder: Diagnostic and therapeutic challenges. *Drugs in Context*, *8*, 1–13. <https://doi.org/10.7573/dic.212573>
- Krueger, R. F., & Eaton, N. R. (2015). Transdiagnostic factors of mental disorders. *World Psychiatry*, *14*(1), 27–29. <https://doi.org/10.1002/wps.20175>
- Leary, M. R., Tate, E. B., Adams, C. E., Allen, A. B., & Hancock, J. (2007). Self-compassion and reactions to unpleasant self-relevant events: The implications of treating oneself

- kindly. *Journal of Personality and Social Psychology*, 92(5), 887–904.
<https://doi.org/10.1037/0022-3514.92.5.887>
- Leaviss, J., & Uttley, L. (2015). Psychotherapeutic benefits of compassion-focused therapy: An early systematic review. *Psychological Medicine*, 45(5), 927–945.
<https://doi.org/10.1017/S0033291714002141>
- Lenferink, L. I. M., Eisma, M. C., de Keijser, J., & Boelen, P. A. (2017). Grief rumination mediates the association between self-compassion and psychopathology in relatives of missing persons. *European Journal of Psychotraumatology*, 8(6), 1378052.
<https://doi.org/10.1080/20008198.2017.1378052>
- Lewis, I. (2018). *Investigating the impact on compassion based interventions on body image concerns: Can self-compassionate letter writing counteract the impact of thin ideals?* (Unpublished doctoral dissertation). University of Southampton. Southampton, UK
- Ley, C., Delacre, M., Mora, Y. L., & Lakens, D. (2019). How to Classify, Detect, and Manage Univariate and Multivariate Outliers, With Emphasis on Pre-Registration. *International Review of Social Psychology*, 32(1), 5. <http://doi.org/10.5334/irsp.289>
- Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage.
- Macatee, R. J., Capron, D. W., Guthrie, W., Schmidt, N. B., & Cogle, J. R. (2015). Distress tolerance and pathological worry: Tests of incremental and prospective relationships. *Behavior Therapy*, 46(4), 449–462. <https://doi.org/10.1016/j.beth.2015.03.003>
- Makkar, S. R., & Grisham, J. R. (2011). Social anxiety and the effects of negative self-imagery on emotion, cognition, and post-event processing. *Behaviour Research and Therapy*, 49(10), 654–664. <https://doi.org/10.1016/j.brat.2011.07.004>
- Mansell, W., Harvey, A., Watkins, E. R., & Shafran, R. (2008). Cognitive behavioural processes across psychiatric diagnosis: a review of the utility and validity of the transdiagnostic approach. *International Journal of Cognitive Therapy*, 1(3), 181–91.
<https://doi.org/1093/med:psych/9780198528883.001.0001>

- Maraldo, T. M., Zhou, W., Dowling, J., & Vander Wal, J. S. (2016). Replication and extension of the dual pathway model of disordered eating: The role of fear of negative evaluation, suggestibility, rumination, and self-compassion. *Eating Behaviors*, *23*, 187–194.
<https://doi.org/10.1016/j.eatbeh.2016.10.008>
- Marshall, S. L., Parker, P. D., Ciarrochi, J., Sahdra, B., Jackson, C. J., & Heaven, P. C. L. (2015). Reprint of “Self-compassion protects against the negative effects of low self-esteem: A longitudinal study in a large adolescent sample.” *Personality and Individual Differences*, *81*, 201–206. <https://doi.org/10.1016/j.paid.2014.09.049>
- Martin, L. L., & Tesser, A. (1996). Some ruminative thoughts. In R. S. Wyer (Ed.), *Ruminative thoughts* (pp. 1–47). Mahwah, NJ: Erlbaum
- Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy*, *36*, 455–470. [https://doi.org/10.1016/S0005-7967\(97\)10031-6](https://doi.org/10.1016/S0005-7967(97)10031-6)
- McCroskey, J. C. (1992). Reliability and validity of the willingness to communicate scale. *Communication Quarterly*, *40*, 16–25. <https://doi.org/10.1080/01463379209369817>
- McCroskey, J. C., & Richmond, V. P. (1990). Willingness to communicate: Differing cultural perspectives. *Southern Communication Journal*, *56*, 72–77.
<https://doi.org/10.1080/10417949009372817>
- McEvoy, P. M., Mahoney, A., Perini, S. J., & Kingsep, P. (2009). Changes in post-event processing and metacognitions during cognitive behavioral group therapy for social phobia. *Journal of Anxiety Disorders*, *23*(5), 617–623.
<https://doi.org/10.1016/j.janxdis.2009.01.011>
- McLaughlin, K. A., & Nolen-Hoeksema, S. (2011). Rumination as a transdiagnostic factor in depression and anxiety. *Behaviour research and therapy*, *49*(3), 186–193.
<https://doi.org/10.1016/j.brat.2010.12.006>
- Methley, A. M., Campbell, S., Chew-Graham, C., McNally, R., & Cheraghi-Sohi, S. (2014). PICO, PICOS and SPIDER: a comparison study of specificity and sensitivity in three

- search tools for qualitative systematic reviews. *BMC health services research*, 14, 579.
<https://doi.org/10.1186/s12913-014-0579-0>
- Mills, A. C., Grant, D. M., Lechner, W. V., & Judah, M. R. (2013). Psychometric properties of the anticipatory social behaviours questionnaire. *Journal of Psychopathology and Behavioral Assessment*, 35(3), 346–355. <https://doi.org/10.1007/s10862-013-9339-4>
- Mosewich, A. D., Crocker, P. R. E., Kowalski, K. C., & DeLongis, A. (2013). Applying self-compassion in sport: An intervention with women athletes. *Journal of Sport and Exercise Psychology*, 35(5), 514–524. <https://doi.org/10.1123/jsep.35.5.514>
- Muris, P., & Petrocchi, N. (2017). Protection or Vulnerability? A Meta-Analysis of the Relations Between the Positive and Negative Components of Self-Compassion and Psychopathology. *Clinical Psychology and Psychotherapy*, 24(2), 373–383. <https://doi.org/10.1002/cpp.2005>
- Muris, P., van den Broek, M., Otgaar, H., Oudenhoven, I., & Lennartz, J. (2018). Good and Bad Sides of Self-Compassion: A Face Validity Check of the Self-Compassion Scale and an Investigation of its Relations to Coping and Emotional Symptoms in Non-Clinical Adolescents. *Journal of Child and Family Studies*, 27(8), 2411–2421.
<https://doi.org/10.1007/s10826-018-1099-z>
- Nathan, P. E., Stuart, S. P., & Dolan, S. L. (2000). Research on psychotherapy efficacy and effectiveness: Between Scylla and Charybdis? *Psychological Bulletin*, 126(6), 964–981. <https://doi.org/10.1037/0033-2909.126.6.964>
- Nayak B. K. (2010). Understanding the relevance of sample size calculation. *Indian journal of ophthalmology*, 58(6), 469–470. <https://doi.org/10.4103/0301-4738.71673>
- Neff, K. D. (2003a). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self & Identity*, 2, 85–101. <https://doi.org/10.1080/152988603>
- Neff, K. D. (2003b). The development and validation of a scale to measure self-compassion. *Self and Identity*, 2, 223–250. <https://doi.org/10.1080/15298860309027>
- Neff, K. D. (2011). Self-compassion, self-esteem, and wellbeing. *Social and Personality Psychology Compass*, 5(1), 1–12. <https://doi.org/10.1111/j.1751-9004.2010.00330.x>

- Neff, K. D., & Germer, C. K. (2013). A Pilot Study and Randomized Controlled Trial of the Mindful Self-Compassion Program. *Journal of Clinical Psychology, 69*(1), 28–44. <https://doi.org/10.1002/jclp.21923>
- Neff, K. D., Tóth-Király, I., Yarnell, L. M., Arimitsu, K., Castilho, P., Ghorbani, N., ... Mantzios, M. (2019). Examining the factor structure of the Self-Compassion Scale in 20 diverse samples: Support for use of a total score and six subscale scores. *Psychological Assessment, 31*(1), 27–45. <https://doi.org/10.1037/pas0000629>
- Newby, J. M., McKinnon, A., Kuyken, W., Gilbody, S., & Dalgleish, T. (2015). Systematic review and meta-analysis of transdiagnostic psychological treatments for anxiety and depressive disorders in adulthood. *Clinical Psychology Review, 40*, 91–110. <https://doi.org/10.1016/j.cpr.2015.06.002>
- Nicassio, P. M., Mendlowitz, D. R., Fussell, J. J., & Petras, L. (1985). The phenomenology of the pre-sleep state: The development of the pre-sleep arousal scale. *Behaviour Research and Therapy, 23*(3), 263–271. [https://doi.org/10.1016/0005-7967\(85\)90004-X](https://doi.org/10.1016/0005-7967(85)90004-X)
- National Institute for Health and Care Excellence. (2013). *Social anxiety disorder: recognition, assessment and treatment*. London: National Institute for Health & Care Excellence.
- Nolen-Hoeksema, S. (1998). Ruminative coping with depression. In J. Heckhausen & C. S. Dweck (Eds.), *Motivation and self-regulation across the life span* (pp. 237-256). New York, NY, US: Cambridge University Press.
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking Rumination. *Perspectives on Psychological Science, 3*(5), 400–424. <https://doi.org/10.1111/j.1745-6924.2008.00088.x>
- O'Connor, S. R., Tully, M. A., Ryan, B., Bradley, J. M., Baxter, G. D., & McDonough, S. M. (2015). Failure of a numerical quality assessment scale to identify potential risk of bias in a systematic review: a comparison study. *BMC Research Notes, 8*, (224). <https://doi.org/10.1186/s13104-015-1181-1>

- Polit, D. F., & Beck, C. T. (2010). Generalization in quantitative and qualitative research: Myths and strategies. *International Journal of Nursing Studies*, 47(11), 1451–1458.
<https://doi.org/10.1016/j.ijnurstu.2010.06.004>
- Polizzi, C. P., Baltman, J., & Lynn, S. J. (2019). Brief meditation interventions: Mindfulness, implementation instructions, and lovingkindness. *Psychology of Consciousness: Theory, Research, and Practice*. <https://doi.org/10.1037/cns0000194>
- Price, M., & Anderson, P. L. (2011). The Impact of Cognitive Behavioral Therapy on Post Event Processing Among Those with Social Anxiety Disorder, *Behaviour Research and Therapy*, 49(2), 132–137. <https://doi.org/10.1016/j.brat.2010.11.006>.
- Rachman, S. (1997). A cognitive theory of obsessions. *Behaviour Research and Therapy*, 35, 793–802. [http://doi.org/10.1016/S0005-7967\(97\)00040-5](http://doi.org/10.1016/S0005-7967(97)00040-5)
- Raes, F. (2010). Rumination and worry as mediators of the relationship between self-compassion and depression and anxiety. *Personality and Individual Differences*, 48(6), 757–761.
<https://doi.org/10.1016/j.paid.2010.01.023>
- Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2011). Construction and factorial validation of a short form of the self-compassion scale. *Clinical Psychology & Psychotherapy*, 18(3), 250-255. <https://doi.org/10.1002/cpp.702>
- Ranganathan, P., Pramesh, C. S., & Aggarwal, R. (2016). Common pitfalls in statistical analysis: Intention-to-treat versus per-protocol analysis. *Perspectives in clinical research*, 7(3), 144–146. <https://doi.org/10.4103/2229-3485.184823>
- Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioral model of anxiety in social phobia. *Behaviour Research and Therapy*, 35(8), 741–756. [https://doi.org/10.1016/S0005-7967\(97\)00022-3](https://doi.org/10.1016/S0005-7967(97)00022-3)
- Rapee, R. M., & Lim, L. (1992). Discrepancy between self and observer ratings of performance in social phobics. *Journal of Abnormal Psychology*, 101, 728–731.
<https://doi.org/10.1037//0021-843x.101.4.728>

- Roelofs, J., Muris, P., Huibers, M., Peeters, F., & Arntz, A. (2006). On the measurement of rumination: a psychometric evaluation of the ruminative response scale and the rumination on sadness scale in undergraduates. *Journal of behavior therapy and experimental psychiatry*, 37(4), 299–313. <https://doi.org/10.1016/j.jbtep.2006.03.002>
- Rockliff, H., Gilbert, P., McEwan, K., Lightman, S., Glover, D. (2008). A pilot exploration of heart rate variability and salivary cortisol responses to compassion-focused imagery. *Journal of Clinical Neuropsychiatry*, 5, 132–139.
- Rockliff, H., Karl, A., McEwan, K., Gilbert, J., Matos, M., & Gilbert, P. (2011). Effects of intranasal oxytocin on compassion focused imagery. *Emotion*, 11, 1388–1396. <https://doi.org/10.1037/a0023861>
- Rodebaugh, T. L., Holaway, R. M., & Heimberg, R. G. (2004). The treatment of social anxiety disorder. *Clinical Psychology Review*, 24(7), 883–908. <https://doi.org/10.1016/j.cpr.2004.07.007>
- Rodebaugh, T. L., Woods, C. M., Heimberg, R. G., Liebowitz, M. R., & Schneier, F. R. (2006). The factor structure and screening utility of the social interaction anxiety scale. *Psychological Assessment*, 18(2), 231–237. <https://doi.org/10.1037/1040-3590.18.2.231>
- Rose, A., McIntyre, R., & Rimes, K. A. (2018). Compassion-focused intervention for highly self-critical individuals: Pilot study. *Behavioural and Cognitive Psychotherapy*, 46(5), 583–600. <https://doi.org/10.1017/S135246581800036X>
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Rowa, K., Gavric, D., Stead, V., LeMoult, J., & McCabe, R. E. (2016). The pernicious Effects of Post-event Processing in Social Anxiety Disorder. *Journal of Experimental Psychopathology*, 7(4), 577–587. <https://doi.org/10.5127/jep.056916>
- Ruscio, A. M., Brown, T. A., Chiu, W. T., Sareen, J., Stein, M. B., & Kessler, R. C. (2008). Social fears and social phobia in the USA: results from the National Comorbidity Survey

Replication. *Psychological medicine*, 38(1), 15–28.

<https://doi.org/10.1017/S0033291707001699>

Schoofs, H., Hermans, D., & Raes, F. (2010). Brooding and reflection as subtypes of rumination:

Evidence from confirmatory factor analysis in nonclinical samples using the Dutch

Ruminative Response Scale. *Journal of Psychopathology and Behavioral Assessment*,

32(4), 609–617. <https://doi.org/10.1007/s10862-010-9182-9>

Schuling, R., Huijbers, M., Jansen, H., Metzemaekers, R., Van Den Brink, E., Koster, F., ...

Speckens, A. (2018). The co-creation and feasibility of a compassion training as a follow-up to mindfulness-based cognitive therapy in patients with recurrent depression.

Mindfulness, 9(2), 412–422. <https://doi.org/10.1007/s12671-017-0783-1>

Shapira, L. B., & Mongrain, M. (2010). The benefits of self-compassion and optimism exercises

for individuals vulnerable to depression. *The Journal of Positive Psychology*, 5(5), 377-

389. <https://doi.org/10.1080/17439760.2010.516763>

Shikatani, B., Antony, M. M., Kuo, J. R., & Cassin, S. E. (2014). The impact of cognitive

restructuring and mindfulness strategies on post event processing and affect in social

anxiety disorder. *Journal of Anxiety Disorders*, 28(6), 570–579.

<https://doi.org/10.1016/j.janxdis.2014.05.012>

Shorter E. (2015). The history of nosology and the rise of the Diagnostic and Statistical Manual

of Mental Disorders. *Dialogues in clinical neuroscience*, 17(1), 59–67.

Sluis, R., Boschen, M., Neumann, D., & Murphy, K. (2017). Repetitive Negative Thinking in

Social Anxiety Disorder 2: Post-Event Processing. *Psychopathology Review*, 4(3), 263–

289. <https://doi.org/10.5127/pr.045616>

Smets, E., Neff, K., Alberts, H., & Peters, M. (2014). Meeting suffering with kindness: Effects

of a brief self-compassion intervention for female college students. *Journal of Clinical*

Psychology, 70(9), 794–807. <https://doi.org/10.1002/jclp.22076>

- Smith, J. M., & Alloy, L. B. (2009). A roadmap to rumination: a review of the definition, assessment, and conceptualization of this multifaceted construct. *Clinical psychology review, 29*(2), 116–128. <https://doi.org/10.1016/j.cpr.2008.10.003>
- Snilstveit, B., Oliver, S., & Vojtkova, M. (2012). Narrative approaches to systematic review and synthesis of evidence for international development policy and practice. *Journal of Development Effectiveness, 4*(3), 409–429. <https://doi.org/10.1080/19439342.2012.710641>
- Spasojević, J., & Alloy, L. B. (2001). Rumination as a common mechanism relating depressive risk factors to depression. *Emotion, 1*(1), 25-37. <https://doi.org/10.1037/1528-3542.1.1.25>
- Stapinski, L. A., Abbott, M. J., & Rapee, R. M. (2010). Evaluating the cognitive avoidance model of generalised anxiety disorder: Impact of worry on threat appraisal. *Behaviour Research and Therapy, 48*(10), 1032-1040, <https://doi.org/10.1016/j.brat.2010.07.005>
- Sterne, J. A., Hernán, M. A., Reeves, B. C., Savović, J., Berkman, N. D., Viswanathan, M., & Carpenter, J. R. (2016). ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. *British Medical Journal, 355*, 4919. <https://doi.org/10.1136/bmj.i4919>
- Stober, J. (1998). Reliability and validity of two widely-used worry questionnaires: Self-report and self-peer convergence. *Personality and Individual Differences, 24*, 887–890. [https://doi.org/10.1016/S0191-8869\(97\)00232-8](https://doi.org/10.1016/S0191-8869(97)00232-8)
- Stopa, L., Brown, M. A., & Hirsch, C. R. (2012). The Effects of Repeated Imagery Practice on Self-Concept, Anxiety and Performance in Socially Anxious Participants. *Journal of Experimental Psychopathology, 3*(2), 223–242. <https://doi.org/10.5127/jep.021511>
- Stopa, L., & Clark, D. M. (2000). Social phobia and interpretation of social events. *Behaviour Research and Therapy, 38*, 273–283. [https://doi.org/10.1016/S0005-7967\(99\)00043-1](https://doi.org/10.1016/S0005-7967(99)00043-1)
- Stopa, L., & Jenkins, A. (2007). Images of the self in social anxiety: Effects on the retrieval of autobiographical memories. *Journal of Behavior Therapy and Experimental Psychiatry, 38*, 459-473. <http://dx.doi.org/10.1016/j.jbtep.2007.08.006>

- Strauss, C., Taylor, B. L., Gu, J., Kuyken, W., Baer, R., Jones, F., & Cavanagh, K. (2016). What is compassion and how can we measure it? A review of definitions and measures. *Clinical Psychology Review, 47*, 15–27. <http://dx.doi.org/10.1016/j.cpr.2016.05.004>
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Pearson.
- Talbot, F., Thériault, J., & French, D. J. (2017). Self-compassion: Evaluation of a psychoeducational website. *Behavioural and Cognitive Psychotherapy, 45*(2), 198–203. <https://doi.org/10.1017/S1352465816000230>
- Thomas, S. (2010). *What do recent developments in the area of self-compassion have to offer the treatment of social anxiety?* (Unpublished Doctoral Thesis, University of Southampton, Southampton, UK). Retrieved from <https://eprints.soton.ac.uk/174283/>
- Treynor, W., Gonzalez, R. & Nolen-Hoeksema, S. (2003). Rumination Reconsidered: A Psychometric Analysis. *Cognitive Therapy and Research, 27*, 247–259. <https://doi.org/10.1023/A:1023910315561>
- van der Heiden, C., Muris, P., Bos, A. E. R., Van Der Molen, H., & Oostra, M. (2009). Normative data for the Dutch version of the Penn State Worry Questionnaire. *Netherlands Journal of Psychology, 65*(2), 69–75. <https://doi.org/10.1007/BF03080129>
- van der Velden, A. M., Kuyken, W., Wattar, U., Crane, C., Pallesen, K. J., Dahlgaard, J., ... Piet, J. (2015). A systematic review of mechanisms of change in mindfulness-based cognitive therapy in the treatment of recurrent major depressive disorder. *Clinical Psychology Review, 37*, 26–39. <https://doi.org/10.1016/j.cpr.2015.02.001>
- Varga S. (2011). Defining mental disorder. Exploring the 'natural function' approach. *Philosophy, ethics, and humanities in medicine : PEHM, 6*, 1. <https://doi.org/10.1186/1747-5341-6-1>
- Wadsworth, L. P., Forgeard, M., Hsu, K. J., Kertz, S., Treadway, M., & Björngvinsson, T. (2018). Examining the Role of Repetitive Negative Thinking in Relations Between Positive and Negative Aspects of Self-compassion and Symptom Improvement During

Intensive Treatment. *Cognitive Therapy and Research*, 42(3), 236–249.

<https://doi.org/10.1007/s10608-017-9887-0>

Wahl, K., Ehring, T., Kley, H., Lieb, R., Meyer, A., Kordon, A., Heinzl, C.V., Mazanec, M., & Schönfeld, S. (2019). Is repetitive negative thinking a transdiagnostic process? A comparison of key processes of RNT in depression, generalized anxiety disorder, obsessive-compulsive disorder, and community controls. *Journal of Behavior Therapy and Experimental Psychiatry* 64, 45-53. <https://doi.org/10.1016/j.jbtep.2019.02.006>

Watkins E. R. (2004). Appraisals and strategies associated with rumination and worry. *Personality and Individual Differences*, 37, 679–694.

<https://doi.org/10.1016/j.paid.2003.10.002>

Watkins, E. R. (2008). Constructive and Unconstructive Repetitive Thought. *Psychological Bulletin*, 134(2), 163–206. <https://doi.org/10.1037/0033-2909.134.2.163>

Watkins, E.R. (2016) *Rumination-focused cognitive-behavioral therapy for depression*. New York: The Guilford Press

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality & Social Psychology*, 54, 1063–1070. <https://doi.org/10.1037/0022-3514.54.6.1063>

Wells, A. (1997). *Cognitive therapy of Anxiety Disorders*. West Sussex: John Wiley and Sons.

Wells, A. (2006). The Metacognitive Model of Worry and generalized anxiety disorder. In: G. Davey & A. Wells (Eds.), *Worry and its psychological disorders: theory, assessment and treatment* (pp. 179–200). West Sussex, England: Wiley & Sons

Werner, K. H., Jazaieri, H., Goldin, P. R., Ziv, M., Heimberg, R. G., & Gross, J. J. (2012). Self-compassion and social anxiety disorder. *Anxiety, Stress and Coping*, 25(5), 543–558.

<https://doi.org/10.1080/10615806.2011.608842>

Westfall, J., Judd, C. M., & Kenny, D. A. (2015). Replicating Studies in Which Samples of Participants Respond to Samples of Stimuli. *Perspectives on Psychological Science*, 10(3), 390–399. <https://doi.org/10.1177/1745691614564879>

- Neymar, M., & Schwabe, L. (2016). Amygdala and Emotion: The Bright Side of It. *Frontiers in Neuroscience*. Retrieved from <https://www.frontiersin.org/article/10.3389/fnins.2016.00224>
- Nolpe, J. (1969). *The practice of behavior therapy*. New York, NY: Pergamon Press.
- Nong, Q. J. J. (2016). Anticipatory Processing and Post-Event Processing in Social Anxiety Disorder: An Update on the Literature. *Australian Psychologist*, *51*(2), 105–113. <https://doi.org/10.1111/ap.12189>
- Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta psychiatrica Scandinavica*, *67*(6), 361–370. <https://doi.org/10.1111/j.1600-0447.1983.tb09716.x>