Does Belief Predict Efficacy of a Self-Compassion Induction?

by

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ABSTRACT

Self-compassion has consistently been found to contribute significantly to psychological well-being, and previous research has found that it can be increased using a simple writing task. As the mechanism underlying task efficacy is unknown, this study investigated the role of belief. Belief was found to predict change in self-compassion, self-esteem, and depression, with higher levels being associated with less improvement, an effect in the opposite direction as hypothesized. However, increase in belief across the three trials was positively correlated with improvement in self-compassion, depression, anxiety, and stress, indicating that change in belief represents a different psychological effect than absolute level of belief. Further, those who increased in belief reported improvement in well-being, while those who decreased did not. Results suggest that task efficacy, at least in part, depends on the degree to which perspectives are reappraised to become more congruent with self-compassionate perspectives, as opposed to simply depending on task repetition.

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INTRODUCTION

Painful experiences are an inevitable part of life, something we will all experience. Some people are able to take these experiences in stride, remaining seemingly unaffected, while for others they may lead to serious mental health problems, most notably depression. Depression has become the world's leading cause of disability (Marcus, Yasamy, Ommeren, Chisholm, & Saxena, 2012), and Statistics Canada estimates that over two million Canadians suffer from some form of mood disorder (Public Health Agency of Canada). In addition to the personal toll on sufferers and their loved ones, depression costs Canadians billions of dollars annually in treatment, lost productivity, and premature death (Barrados et al., 2001). Although empirically supported treatments for depression exist (Hollon & Ponniah, 2010), many people are unable to access them due to an insufficient number of mental health professionals. Accordingly, research into prevention and treatment strategies that are simple and inexpensive to implement is important. A promising focus for such research is on the trait of self-compassion.

Self-compassion is a concept rooted in Eastern religious and philosophical thought, which consists of self-kindness, a mindful, dispassionate attitude toward personal shortcomings, and an understanding that one is part of a common humanity (i.e. the normalizing of faults)(Neff, 2003). Self-compassion can help buffer individuals from the psychologically and emotionally damaging consequences of painful life events, and is also relevant when considering personal inadequacies and past failures. It is similar to self-esteem, in that it involves the experience of positive emotions toward the self, but there are important distinctions. Unlike self-esteem, self-compassion does not involve self-evaluation, and so is not contingent on external experiences or social comparisons.

Consequently, self-compassion allows for greater resilience and stability, while also encouraging more positive relationship behaviour when compared to self-esteem (Neff & Vonk, 2009).

Self-compassion is assessed using a self-report questionnaire, the Self-Compassion Scale, which is based on the operationalization of self-compassion provided by Neff (2003). Accordingly, high self-compassion involves patience and kindness toward the self when experiencing suffering, less self-judgement, a greater ability to keep emotions in balance, and greater feelings of connectedness to others and less isolation when experiencing negative emotions. The importance of self-compassion for mental health is supported by a range of findings that link self-compassionate attitudes to more positive reactions to negative life events (Leary, Tate, Adams, Allen, & Hancock, 2007). Self-compassion is also associated with greater life satisfaction, social connectedness, personal initiative, curiosity, happiness, and optimism, in addition to less self-criticism, depression, anxiety, rumination, thought suppression, perfectionism, and disordered eating behaviours (Neff, 2003; Neff & Vonk, 2009).

Not surprisingly, given the apparent benefits of possessing a high degree of self-compassion, a variety of interventions have been developed over the past few decades which have been found to increase mindfulness and self-compassion. Mindfulness-based therapies, such as Acceptance-Based Behaviour Therapy (Roemer & Orsillo, 2009) and Mindfulness-Based Stress Reduction (Kabat-Zinn & Hanh, 2009), train individuals or groups of clients in mindful meditation practices over the course of several weeks or months. Although effective, such interventions involve a great deal of time, commitment and cost, making them impractical for some and beyond the means of others. Accordingly,

researchers have investigated the efficacy of using a simple, easily implemented writing task to increase self-compassion (e.g. Leary et al., 2007).

A substantial body of research from the past 25 years has demonstrated the physical and psychological benefits of writing about negative emotional experiences (Gortner, Rude, & Pennebaker, 2006; Sloan & Marx, 2004). The majority of this research has focused on expressive writing, which requires participants to describe their thoughts and feelings about a negative emotional experience or issue that has affected them (James W Pennebaker, 1997). The beneficial effects of this task have been attributed to re-organization and assimilation of emotional experiences into a coherent narrative that provides the writer with insight (J. W. Pennebaker, Colder, & Sharp, 1990). Although the self-compassion writing task also requires participants to write about a distressing or shameful event, the key component of the task is having them write about this experience again from a self-compassionate perspective. Thus, this task brings about an improvement in well-being through a different mechanism than the expressive writing task, namely by increasing self-compassion. Indeed, previous research comparing expressive writing to the self-compassion writing task has demonstrated differential effects on well-being, with increased self-compassion and decreased depression being observed in the latter group (Johnson & O'Brien, 2013).

Studies employing the self-compassion writing task have found that it effectively decreased depression and increased measures of emotional well-being, including self-reported happiness (Johnson & O'Brien, 2013; Leary et al., 2007; Shapira & Mongrain, 2010). Since shame and self-compassion elicit opposing perspectives, adopting a self-compassionate attitude may help to supplant associations between the memory of an

experience of shame and the negative emotions and cognitions that characterize shame. Specifically, a self-kind perspective may undermine self-criticism and negative self-evaluation, a perspective of one's common humanity may counter thoughts that one is particularly awful and should withdraw from others, and a mindful perspective may decrease the tendency to avoid the unpleasant emotions elicited by such a negative experience.

Although the size of effects generated by self-compassion inductions is often small, they have been shown to reduce depressive symptoms and shame-proneness by a statistically significant amount (e.g. Johnson & O'Brien, 2013). Given that even a small change in self-compassion is accompanied by a measurable improvement in well-being, it behooves researchers to investigate the mechanism by which the task works. By identifying an underlying psychological mechanism that explains task efficacy, the task may be improved upon and made more effective. Two possible mechanisms by which the self-compassion writing task may operate are extinction (Sloan & Marx, 2004) and reappraisal.

Extinction is the process by which a stimulus, such as the memory of a past event, which is associated with a response, such as negative affect or distress, ceases to trigger the response. This is believed to occur due to the formation of a new association that inhibits the old one (Quirk et al., 2010); for example, if the memory is repeatedly paired with a self-compassionate response, the memory-distress association will be inhibited, and thus no longer expressed. Extinction involves the down-regulation of the amygdala by the hippocampus and ventromedial prefrontal cortex (vmPFC), a network that is strengthened by training in mindfulness (Hölzel et al., 2011; LaBar & Cabeza, 2006). Since mindfulness is an important component of self-compassion (Neff, 2003), it is reasonable to expect that the

self-compassion task works, at least in part, by extinguishing the association between memories and negative affect.

Cognitive reappraisal involves reformulating the meaning of an experience in order to alter the effect of emotion-generating cues, and has been associated with increased positive affect and life satisfaction, and decreased depression and anxiety (Moore, Zoellner, & Mollenholt, 2008). Although the neural correlates of reappraisal are very similar to that of extinction, (Delgado, Nearing, Ledoux, & Phelps, 2008; Goldin, McRae, Ramel, & Gross, 2008; Johnstone, van Reekum, Urry, Kalin, & Davidson, 2007), reappraisal can be distinguished by the involvement of cognitive control regions, such as dorsal and ventrolateral prefrontal cortex (Buhle et al., 2013; Hölzel et al., 2011; Koenigs & Grafman, 2009; MacDonald, Cohen, Stenger, & Carter, 2000). While extinction may operate outside of awareness, reappraisal is generally considered to involve conscious processes, such as working memory (Ochsner & Gross, 2008). Thus, it is likely that it requires some degree of conscious belief in the reformulated interpretation of an experience, while extinction, as a form of associative learning, would not depend on belief.

Along these lines, belief in one's ability to successfully implement cognitive reappraisal mediates the effect of cognitive behavioural therapy on social anxiety (Goldin et al., 2012). Thus, cognitive reappraisal self-efficacy increases with training and practice, and this increase predicts improved well-being. Furthermore, it is believed that those with low cognitive reappraisal self-efficacy more often use dysfunctional strategies for emotional regulation (Thomasson & Psouni, 2010). Indeed, when depressed individuals are asked to reappraise affective stimuli, instead of down-regulating activity in the amygdala, vmPFC activity actually increases amygdalar activity, resulting in more negative

affect (Hölzel et al., 2011; Johnstone et al., 2007). Similar activation is found in expressive suppression (Goldin et al., 2008), which is a form of emotional regulation in which the focus is on altering emotional output. Unlike cognitive reappraisal, suppression is associated with reduced positive affect and life satisfaction, greater depression and anxiety, and more negative emotional responses to negative affective stimuli (Moore et al., 2008). Thus, it appears that depressed individuals have difficulty reappraising negative experiences in a more positive light, resorting instead to the use of maladaptive strategies for emotional regulation.

Together, these studies show that belief in one's ability to see the 'bright side' of a negative experience is associated with greater success in implementing reappraisal, and ultimately is important for well-being. Confidence that one is able to use positive reappraisals to regulate emotion likely stems from a belief that the reappraisals themselves are believable: if someone is trying to improve their mood by reinterpreting a distressing situation, it is not likely to be helpful unless that interpretation actually makes sense to them in some way. This assumption is supported by research on the Elaboration Likelihood Model of Persuasion, which contends that when personal relevance is high, attitude change depends more on the cogency of an argument than on the superficial aspects of its delivery (Petty, Cacioppo, & Haugtvedt, 1992).

If belief in positive reinterpretations is important for successful cognitive reappraisal, it would follow that if the self-compassion writing task works by encouraging reappraisal, then those who have difficulty believing in such reinterpretations would show less improvement with the task, and conversely that those who have high belief would show greater improvement. Alternately, if the task does not depend on reappraisal, but

instead on a more automatic associative learning process, such as extinction, then belief would not mediate task effectiveness. Importantly, belief can be conceptualized in multiple ways; for example, we may believe something because it makes sense to us in an intellectual way, or we may believe something because it *feels* true to us. Clinicians from a variety of orientations have made this distinction (e.g. Martin, 2011; Salas-Auvert & Felgoise, 2003; Stott, 2007), and found it to have implications for treatment efficacy. For example, cognitive behavioural therapy often involves the use of both thought records and behavioural experiments, which have been found to differentially impact beliefs and behaviours. Research suggests that behavioural experiments yield a more compelling quality of evidence that is felt at a different level (i.e. in the "heart", or at an emotional level, as opposed to in the "head", or at an intellectual level), leading to greater therapeutic change (Bennett-Levy, 2003). In the present study, both types of belief will be evaluated in order to increase consistency in participant interpretation of the term "belief", as well as to determine whether this distinction has meaning for the purpose of the self-compassion writing task.

Emotion regulation strategies and the ability to engage in self-compassion vary from person to person. For example, recent work has shown that many people experience fear of compassion, leading them to actively resist attempts to increase self-compassion (Gilbert, McEwan, Matos, & Rivis, 2011). Indeed, even in a non-depressed sample, there are likely to be individuals who have difficulty engaging in reappraisal. In particular, those who are low in self-compassion may not find self-compassionate perspectives to be very believable. However, the writing task does not require participants to write what they believe, so although the task may be more difficult for these individuals, they should still be

able to complete it. Importantly, engaging in self-compassionate writing could be considered counter-attitudinal behaviour for these participants, and so they may experience cognitive dissonance. Cognitive dissonance occurs when a person's actions and attitudes are discrepant; the resulting aversive state motivates attitude change to reconcile them with the actions (Wood, 2000). Interestingly, neuroimaging results suggest that cognitive dissonance leads to attitude change via a mechanism similar to reappraisal (Jarcho, Berkman, & Lieberman, 2011). Thus, practice with the self-compassion task may lead to cognitive dissonance and attitude change, which would create belief in the self-compassionate perspectives and therefore facilitate reappraisal. Accordingly, it remains unclear as to whether the self-compassion writing task works through extinction or reappraisal.

The present study examined whether degree of belief in the self-compassionate perspectives generated by participants predicted subsequent change in self-compassion, depression, shame-proneness, rumination, and self-esteem. If belief predicts outcome, this would indicate that the task operates primarily via reappraisal, as opposed to extinction, and would indicate that improvements to the task should emphasize persuasion, as opposed to repetition (i.e. performing the task multiple times to increase effectiveness). Previous research showing a decoupling of shame and negative affect regarding the memory of an experience of shame found that repetition with the self-compassion task was necessary before this effect was observed (Johnson & O'Brien, 2013), suggesting that it may involve extinction to some extent. However, it is less likely that long-term changes in trait self-compassion, depression, shame-proneness, rumination and self-esteem are due to simple extinction. Indeed, it is reasonable to expect that belief would affect task efficacy, in

so far as reported belief reflects the degree to which the self-compassionate perspectives are internalized, or incorporated into the participant's own perspective of the experience.

Accordingly, it is expected that the decoupling of shame and negative affect is due to both reappraisal and extinction, and as a result of the latter, will occur independently of belief. On the other hand, it is expected that the outcome of practicing self-compassion (measured by changes in self-compassion, depression, shame-proneness, rumination and self-esteem) is attributable primarily to reappraisal and cognitive dissonance, and so will depend on belief. Perceived difficulty of the self-compassion task and the amount of effort put into it are also examined in order to determine whether belief mediates their effect on self-compassion and depression. Just as Johnson and O'Brien (2013) found task effectiveness increased with practice, so should effort predict outcome; and if belief predicts outcome, then it should mediate this relationship. Further, as previous research has found that the more difficult it is to engage in a counter-attitudinal task, the less attitude change occurs (Waenke, Bless, & Biller, 1996), it is expected that participants who find the task more difficult will report lower belief and have poorer outcomes.

Research Hypotheses:

Hypothesis 1: Scores measuring belief in self-compassionate perspectives are hypothesized to predict change in five variables: a) self-compassion, b) depression, c) rumination, d) shame-proneness, and e) self-esteem, with higher belief leading to increased self-compassion and self-esteem, and decreased depression, rumination and shame-proneness.

Hypothesis 2: It is expected that 'belief in head', which assesses perception of factual truth, will be a weaker predictor of the five outcome variables than 'belief in heart', which assesses a more subjective *feeling* of truth and so reflects a greater degree of internalization of the self-compassionate perspective.

Hypothesis 3: The relationship between effort and the five outcome variables is expected to be mediated by belief.

Hypothesis 4: The relationship between task difficulty and the five outcome variables is expected to be mediated by belief.

Hypothesis 5: The association between shame and negative affect is expected to decrease across trials (i.e. practice with the self-compassion writing task), as was found by Johnson and O'Brien (2013); as this is hypothesized to occur via extinction, it should occur irrespective of belief.

Hypothesis 6: The self-compassion task is expected to produce an immediate decrease in negative affect.

In addition to these hypotheses, the following questions will be explored:

1. Does belief in one's ability to implement cognitive reappraisal (i.e. cognitive reappraisal self-efficacy), or change in this belief, predict outcome?
2. Does the relationship between belief and outcome differ for those reporting disbelief compared to those reporting some degree of belief?
3. Does belief, effort, or task difficulty change as a result of practice with the task?
4. Do the relationships between belief and outcome differ among the three components of self-compassion (common humanity, self-kindness, and mindfulness)?

METHOD

Participants:

Participants were 57 undergraduate students (42 female, 15 male) over the age of 18 (M = 19.9) enrolled in PSYC 1200 at the University of Manitoba, recruited online through the Department of Psychology Experiment Management System. In exchange for participation, students received participant pool experimental credits.

Measures:

Self-compassion: Self-compassion was measured with the Self-Compassion Scale (SCS; Appendix A)(Neff, 2003). The SCS consists of 26-items (13 positively- and 13 negatively-valenced) and was administered using a 7-point scale ranging from 1 (*almost never*) to 7 (*almost always*). Although all hypotheses were evaluated using the total scale score, the scale may be divided into six subscales, with oppositely-valenced pairs assessing the three main components of self-compassion: self-kindness vs. self-judgement, common humanity vs. isolation, and mindfulness vs. over-identification. For the purpose of evaluating research question 3, the negatively-valenced subscales were reverse-coded in order to obtain three subscales, corresponding to self-kindness, common humanity, and mindfulness. The SCS has shown very good test-retest reliability over a period of three weeks (r = .93)(Neff, 2003), as well as high internal consistency (α = .90)(Johnson & O'Brien, 2013). In the present sample, internal consistency was high (pre-treatment α = .91, post-treatment α = .91).

Depression: Depression was assessed with two measures – the Beck Depression Inventory (BDI; see Appendix B)(Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and the Depression Anxiety Stress Scales (DASS; see Appendix C)(Lovibond & Lovibond, 1995). The BDI consists of 21 items, rated for severity on a scale from 0 to 3. The DASS contains 42 items, 14 of which comprise the depression subscale, and each item is rated on a scale from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*).

These two measures assess depression somewhat differently, with the BDI representing a more clinical perspective than the DASS, which was developed with a non-clinical sample. The BDI has been shown to have adequate convergent validity and good discriminant validity with measures of anxiety (Weeks & Heimberg, 2005), but somewhat lower internal consistency than the DASS depression scale, with α values of .84 and .91, respectively (Lovibond & Lovibond, 1995). The DASS depression scale also shows good convergent validity with the BDI (Antony, Bieling, Cox, Enns, & Swinson, 1998) and test-retest reliability of .71 over a two week period (Brown, Chorpita, Korotitsch, & Barlow, 1997). In the present sample, internal consistency for both measures was high (BDI pre-treatment α = .90, post-treatment α = .94; DASS depression pre-treatment α = .93, post-treatment α = .95).

Shame-proneness: Shame-proneness was assessed with the Test of Self-Conscious Affect (TOSCA-3; see Appendix D)(Tangney, Dearing, Wagner, & Gramzow, 2000). The TOSCA-3 is comprised of 16 items, which present hypothetical scenarios of social/moral transgressions and asks participants to rate, on a scale from 1 (*not likely*) to 5 (*very likely*), the likelihood that they would respond in certain ways. The TOSCA-3 is often used to distinguish between the similar, but distinct, constructs of shame and guilt, and

consequently it is recommended that both measures be entered into regression models together in order to control shared variance (Tangney et al., 2000). More recent research suggests that the guilt subscale measures motivation to make amends for personal wrongdoing, while the shame subscale measures the tendency to experience negative self-conscious affect (Giner-Sorolla, Piazza, & Espinosa, 2011). In the present study, we are not concerned with separating the motivation to make amends from the experience of shame, so the shame subscale was used independently of the guilt subscale.

The shame subscale has been found to have moderate test-retest reliability over a period of 11 weeks (r = .66) and moderate internal consistency (α = .77)(Andrews, Qian, & Valentine, 2002). The TOSCA-3 showed good internal consistency in the present sample (shame scale pre-treatment α = .80, post-treatment α = .85).

Rumination: The Ruminative Responses subscale of the Response Styles Questionnaire (RRS; see Appendix E) (Nolen-Hoeksema & Morrow, 1991) was used to measure rumination. The RRS is comprised of 22 items that assess how often (*never*, *sometimes*, *often* or *always*), in general, participants respond to depressed mood by focusing on self, symptoms, or possible causes and consequences of their mood. The RRS has shown good test-retest reliability over a five month period (r = .80)(Nolen-Hoeksema, Parker, & Larson, 1994) and good internal consistency (α = .89)(Nolen-Hoeksema & Morrow, 1991). In the present sample, internal consistency was high (pre-treatment α = .92, post-treatment α = .94).

Self-esteem: Self-esteem was assessed with the Rosenberg Self-Esteem Scale (RSE; see Appendix F)(Rosenberg, 1965). The RSE contains 10 items, five positively-valenced and five negatively-valenced, and uses a 4-point scale ranging from 1 (*strongly disagree*) to

4 (*strongly agree*). The RSE has shown good discriminant and concurrent criterion-related validity, and high internal consistency (α = .91)(Sinclair et al., 2010). In the present sample, the RSE showed high internal consistency (pre-treatment α = .93, post-treatment α = .92).

Mood: Current mood was evaluated using a 16-item measure that assesses anger, sadness, anxiety and happiness (see Appendix G)(Leary et al., 2007). Each item is rated on a 7-point scale, ranging from 1 (*not at all*) to 7 (*extremely*). This scale has demonstrated high internal consistency (α = .94)(Johnson & O'Brien, 2013), including in the present sample (all α > .90).

Cognitive reappraisal self-efficacy: Cognitive reappraisal self-efficacy was assessed using the eight item Self-Efficacy subscale of the Emotion Regulation Questionnaire (see Appendix H)(Goldin, Manber-Ball, Werner, Heimberg, & Gross, 2009; Goldin et al., 2012). Items are rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). This subscale was found to have very good internal consistency (α = .95)(Goldin et al., 2012), while the Emotion Regulation Questionnaire from which it is derived was shown to have good reliability and construct validity (Gross & John, 2003). In the present sample, internal consistency was high (pre-treatment α = .90, post-treatment α = .90).

Effort, task difficulty & belief: Independent and mediating variables were assessed by self-report. Effort and task difficulty were assessed using a single item for each, and belief was assessed with two items, one reflecting 'belief in head' and the other 'belief in heart'. The exact wording of these items can be found in the Procedure section.

Procedure:

The methodology used in the present study is adapted from that used by Johnson and O'Brien (2013).

Baseline Measures: Before trial 1, baseline self-compassion, depression, shame-proneness, rumination, self-esteem, and cognitive reappraisal self-efficacy were assessed. Participants scoring 150 or higher on the SCS were excluded from the remainder of the study. This cut-off represents two standard deviations above the mean obtained by Johnson and O'Brien (2013). The reason for the exclusion is that an intervention designed to increase self-compassion is not likely to be effective for those with very high baseline scores (Leary et al., 2007).

Shame Task: After baseline measures were obtained, participants were asked to recall and rate an experience of shame. They were asked the following: "*Take a few moments to think of a negative event that occurred in the last 5 years (during high school or university) that made you feel ashamed of yourself*. *This event may have made you feel as if you were a completely awful or worthless person*. *This could be something that involved failure, humiliation, or rejection*" (Johnson & O'Brien, 2013). They were then presented with a text box permitting open-ended responding, and asked: "*Please describe the experience. Include such things as: what led up to it; who was present; precisely what happened; and most importantly, how you felt and behaved at the time*." Despite the sensitivity of this task, the use of an internet survey design should have reduced socially desirable responding.

Following shame recall, participants were asked to rate, on a scale from 1 (*completely ashamed*) to 5 (*not particularly ashamed*), how ashamed they felt during this experience as well as how ashamed they feel now. Responses were scored in reverse, such

that a higher score reflects greater shame. They were also asked to complete the mood questionnaire.

Self-Compassion Task: Following the mood questionnaire, all participants completed the self-compassion task. This task requires participants to provide written responses to three instructions designed to elicit a self-compassionate perspective on the previously recalled experience of shame. The following instructions were provided: "*Bearing in mind the experience you just described, please provide a written response to each of the following three instructions. It is important for you to really make an effort with your responses and to write down everything that is relevant.*" An acceptance of common humanity was encouraged by asking participants to "*List as many ways as you can think of in which other people also experience similar events to the one you just described*". Self-kindness was encouraged by asking them to "*Write a paragraph expressing understanding, kindness, and concern to yourself the way you might express concern to a friend who had undergone the experience*". Finally, a mindful, dispassionate perspective was encouraged by asking participants to "*Describe your feelings about the experience in an objective and unemotional fashion*". Following these writing exercises, they were again asked to rate how ashamed they feel and complete the mood questionnaire.

Effort, Difficulty & Belief in Self-Compassionate Perspective: Effort and difficulty were assessed directly through self-report. Instructions were as follows: "*A few minutes ago you provided written responses to three prompts, each asking you to describe a different aspect of the same experience. Thinking about your responses, on a scale of 1 (none) to 7 (a lot), please rate: Overall, how much effort did you put in to generating your responses? Overall, how difficult was it for you to generate your responses?*".

Participants were then presented with each of their three self-compassion compositions (separately) and asked to rate belief on a scale from 1 (completely disbelieve) to 100 (completely believe). Belief was divided into belief "in head" and belief "in heart", and was assessed as follows: "*How much do you <u>believe in your head</u> in what you have written here? In other words, how much do you believe that what you have written is factually true?*", followed by "*How much do you <u>believe in your heart</u> in what you have written here? In other words, how much does what you have written <u>feel</u> true to you?*". Belief scores for the three compositions were averaged to obtain a single 'believe in head' score (α=.63) and a single 'believe in heart' score (α=.50).

Trials 2 and 3: This procedure (excluding baseline measures) was repeated three times over one week, as effectiveness of the task has been found to increase with practice (Johnson & O'Brien, 2013). Internal consistency of belief scores for trial 2 were α=.57 and α=.68 for 'believe in head' and 'believe in heart', respectively, while for trial 3 these values were α=.81 and α=.77.

Follow-up: Two weeks after completion of trial 3, self-compassion, depression, shame-proneness, rumination, self-esteem, and cognitive reappraisal self-efficacy were again assessed to permit evaluation of the efficacy of the self-compassion writing task.

Design:

This study used a pre-experimental, one-group pre-test-post-test design, in which all participants were exposed to the treatment and outcome variables were assessed pre- and post-treatment (Creswell, 2009). Self-reported belief, task difficulty and effort were the independent variables, and depression, self-compassion, shame-proneness, rumination

and self-esteem constituted the primary dependent variables; belief was also assessed as a possible mediating variable. All components of this study were conducted online using Qualtrics survey software.

RESULTS

Dataset

Participant flow. A total of 335 participants completed the baseline measures and Trial 1 of the self-compassion writing task. Of these 335 participants, 197 participated in Trial 2, 135 participated in Trial 3, and 70 began the follow-up measures at Time 4. Of these 70 participants, two were excluded because they did not complete all three trials of the self-compassion task, and four were excluded for not completing the follow-up measures. Additionally, seven participants were excluded on the basis of their dependent variable scale scores. One of these participants was excluded for having a baseline Self-Compassion Scale score over 150, and the other six corresponded to outliers on at least one of the primary outcome variables. Accordingly, the final sample consisted of 57 participants (42 female).

Comparison of completers vs. non-completers. Independent samples t-tests comparing baseline scores of the completers and non-completers showed no significant differences between the two groups on mean age, self-compassion, or depressive symptoms (all p's $> .65$). Similarly, Fisher's exact test showed no difference between the two groups in the proportions of male and female participants.

Preliminary Analyses

Descriptive statistics. Table 1 provides the means, standard deviations, minima and maxima for each of the scales administered, as well as the six primary outcome measures. Intercorrelations for all study variables are provided in Table 2. Normality was assessed by calculating skewness and kurtosis for each of the independent and dependent variables. Using 10,000 bootstrap samples, 95% confidence intervals indicated that the distributions of change in self-esteem, Trial 2 effort, Trial 3 difficulty, Trial 3 change in negative affect, and several measures of shame showed significant kurtosis (see Table 3). Change in self-esteem and DASS depression were significantly skewed, as were all measures of belief and several measures of shame and difficulty (see Table 4). Although non-normality can lead to underestimation of the magnitude of correlation coefficients and reduced power when conducting statistical tests such as linear regression and analysis of variance (Dunlap & Burke, 1995), these tests assume normality of error variance, not necessarily normality in the distributions of variables. Accordingly, for each regression analysis conducted, standardized residual plots were examined to determine whether they were approximately normally distributed. Visual inspection revealed at least some deviation from normality in all plots, however no plots showed very substantial non-normality, particularly with regard to skewness. Accordingly, no transformations were applied, but non-parametric bootstrapping was used for all regression analyses. Further, since all measures of belief showed substantial skew, correlations using these measures were conducted using the non-parametric Spearman's rho.

Table 1

Descriptive statistics for scales and primary outcome measures.

Scale	Time Point	Mean	Standard Deviation	Minimum	Maximum
Self-Compassion Scale	T1	101.67	21.93	57.00	148.00
	T4	103.24	20.86	60.00	154.00
Beck Depression Inventory	T1	12.47	9.12	0.00	49.00
	T4	11.05	10.62	0.00	44.00
DASS-42 Depression	T1	9.40	8.94	0.00	40.00
	T4	9.72	9.59	0.00	39.00
Rosenberg Self-Esteem Scale	T1	27.58	6.82	10.00	40.00
	T4	28.56	6.20	10.00	40.00
TOSCA-3 Shame	T1	49.62	10.61	26.00	69.00
	T4	49.39	11.42	19.00	73.00
Ruminative Responses Scale	T1	46.75	13.42	26.00	78.00
	T4	45.56	14.28	26.00	85.00
Cognitive Reappraisal Self-Efficacy Scale	T1	4.60	1.11	2.25	7.00
	T4	4.63	0.98	2.50	7.00
Mood Scale	T1 Pre-task	45.96	21.14	17.00	91.00
	T1 Post-task	44.44	21.64	17.00	92.00
	T2 Pre-task	41.68	15.92	16.00	88.00
	T2 Post-task	39.98	15.38	16.00	82.00
	T3 Pre-task	43.67	15.15	16.00	82.00
	T3 Post-task	42.63	16.19	16.00	86.00
ΔSCS	T4 – T1	1.57	14.08	-29.00	40.00
ΔBDI	T4 – T1	-1.42	6.46	-18.00	14.00
ΔDASS Depression	T4 – T1	0.32	6.87	-13.00	21.00
ΔRSE	T4 – T1	0.98	3.39	-6.00	12.00
ΔTOSCA-3 Shame	T4 – T1	-0.23	6.53	-19.00	15.00
RRS Change	T4 – T1	-1.19	10.34	-26.00	25.00

Note: DASS-43 = Depression, Anxiety, Stress Scale – 42 Item; TOSCA-3 = Test of Self-Conscious Affect – 3.

Table 2

Intercorrelations of study variables.

Variable	T1 Belief Head	T1 Belief Heart	Avg. Effort	Avg. Diff.	ΔSCS	ΔBDI	ΔDASS Dep.	ΔRSE	ΔTOSCA -3 Shame	ΔRRS
T1 Belief Head	--	.750**	.198	-.164	-.283*	.089	.192	-.324*	.052	.126
T1 Belief Heart	.750**	--	.071	-.270*	-.351**	.054	.108	-.345**	.062	-.053
Avg. Effort	.198	.071	--	-.112	-.071	-.132	-.180	-.066	.169	.003
Avg. Diff.	-.164	-.270*	-.112	--	.003	.029	.175	.011	.051	-.061
T1 SCS	.059	.209	.078	-.380**	-.396**	.142	.169	-.235	-.055	.064
T4 SCS	-.129	-.017	.034	-.398**	.259	-.136	-.106	-.015	-.268*	-.117
T1 BDI	.073	-.182	-.013	.358**	.048	-.104	-.024	.065	.150	.171
T4 BDI	.117	-.123	-.092	.325*	-.216	.519**	.347**	-.003	.270*	.270*
T1 DASS Dep.	.043	-.194	.044	.324*	.223	-.146	-.286*	.204	.090	-.040
T4 DASS Dep.	.177	-.123	-.092	.325*	-.093	.297*	.449**	.009	.131	.229
T1 RSE	.037	.183	.256	-.408**	-.076	-.086	-.021	-.422**	-.126	-.073
T4 RSE	-.137	.013	.246	-.442**	.104	-.147	-.161	.082	-.121	-.203
T1 TOSCA-3 Shame	.156	.108	-.030	.222	-.109	.140	.113	-.089	-.179	-.017

Variable	T1 Belief Head	T1 Belief Heart	Avg. Effort	Avg. Diff.	ΔSCS	ΔBDI	ΔDASS Dep.	ΔRSE	ΔTOSCA -3 Shame	ΔRRS
T4 TOSCA-3 Shame	.174	.136	.069	.236	-.279*	.262*	.143	-.064	.405**	.096
T1 RRS	-.007	-.134	.111	.366**	.182	-.103	-.223	.144	-.155	-.300*
T4 RRS	.084	-.164	.107	.300*	-.026	.049	.059	-.026	-.004	.442**
ΔSCS	-.283*	-.351**	-.071	.003	--	-.424**	-.420**	.344**	-.311*	-.273*
ΔBDI	.089	.054	-.132	.029	-.424**	--	.604**	-.097	.232	.202
ΔDASS Dep.	.192	.108	-.180	.175	-.420**	.604**	--	-.252	.066	.371**
ΔRSE	-.324*	-.345**	-.066	.011	.344**	-.097	-.252	--	.032	-.224
ΔTOSCA-3 Shame	.052	.062	.169	.051	-.311*	.232	.066	.032	--	.195
ΔRRS	.126	-.053	.003	-.061	-.273*	.202	.371**	-.224	.195	--

* $p < 0.05$. ** $p < 0.01$.

Table 3

Variables with significant kurtosis.

Variable	Statistic	95% Confidence Interval
RSE Change	2.921	[0.246, 6.008]
T3 Negative Affect Change	2.677	[0.577, 5.348]
T2 Effort	-0.991	[-1.438, -0.315]
T3 Difficulty	-1.067	[-1.408, -0.386]
T1 Pre-task Shame	-0.910	[-1.312, -0.209]
T3 Pre-task Shame	-1.147	[-1.442, -0.633]
Average Pre-task Shame	-0.725	[-1.176, -0.074]

Note: Negative affect change was calculated by subtracting pre-writing task scores from post-writing task scores, within a single trial.

Table 4

Variables with significant skew.

Variable	Statistic	95% Confidence Interval
DASS-42 Depression Change	1.091	[0.484, 1.631]
RSE Change	1.271	[0.017, 1.940]
T1 Belief in Head	-1.481	[-2.065, -0.923]
Average Belief in Head	-2.173	[-2.941, -0.728]
T1 Belief in Heart	-1.377	[-1.902, -0.861]
Average Belief in Heart	-1.422	[-2.051, -0.508]
T1 Difficulty	-0.860	[-1.364, -0.423]
T2 Difficulty	-0.464	[-0.857, -0.078]
Average Difficulty	-0.561	[-1.006, -0.135]
T2 Pre-task Shame	0.442	[0.019, 0.848]

Table 5

Non-parametric correlations between belief and outcome.

Outcome	T1 Belief in Head	Sig.	T1 Belief in Heart	Sig.
ΔSCS	-0.218	0.103	-0.369	0.005
ΔRSE	-0.429	0.001	-0.332	0.012
ΔBDI	0.178	0.185	0.102	0.449
ΔDASS-42 Depression	0.212	0.113	0.214	0.110
ΔDASS-42 Anxiety	0.174	0.194	0.124	0.357
ΔDASS-42 Stress	0.266	0.046	0.154	0.251
ΔTOSCA-3 Shame	0.054	0.688	0.105	0.438
ΔRRS	0.148	0.271	0.037	0.786

Primary Analyses

Analytic Strategy. All data was analysed in SPSS version 21 with the custom dialogue PROCESS installed. Process was designed by Andrew Hayes, and allows for mediation analysis in SPSS (Hayes, 2012). For all analyses, outcome variables are change scores, which were calculated by subtracting scale scores at baseline from those obtained at follow-up.

Hypothesis 1. To assess whether belief predicted changes in outcome, I regressed change scores from each of the six outcome measures (SCS, BDI, DASS-42 Depression, TOSCA-3 Shame, RRS, RSE) on each of the two measures of belief ('in head' and 'in heart'), including average self-reported effort and difficulty as covariates. Belief scores from Trial 1 were used to assess the effect of belief on outcome in order to avoid confounding the results. The reasoning behind this is that practice with the task was expected to increase self-compassion, and because higher self-compassion is likely to cause self-compassionate perspectives to seem more believable, it was expected that belief would increase across trials. Indeed, belief in head scores were found to increase from trial 1 to trial 3, although

SCS scores did not significantly change. Accordingly, measures of belief obtained at Trial 3 would be expected to be influenced by task efficacy, thus increasing the correlation with outcome. Although this would provide interesting information, the direction of the effect would be less clear than if I use a measure of belief obtained at Trial 1.

For each of the two sets of regression analyses, the Benjamini-Hochberg procedure was used in order to limit the likelihood of a Type I error, using a significance level of $\alpha = .10$ (Benjamini & Hochberg, 1995). Further, as inspection of standardized residuals plots revealed heteroscedasticity in many of the regression models, 5000 sample bootstrap confidence intervals were used instead of traditional p-values, as violation of the assumption of homoscedasticity can lead to inconsistent standard errors that are either too large or too small (Scott Long & Ervin, 1998). Significance levels for these confidence intervals were determined using the Benjamini-Hochberg procedure. Accordingly, for each set of six analyses, standardized regression coefficients will be ordered from largest to smallest in magnitude, and significance level will be equal to rank divided by the total number of analyses and multiplied by the false discovery rate (i.e. [i/6]x[0.10]). This results in significance levels ranging from $\alpha=0.017$ for the largest effect to $\alpha=0.10$ for the smallest effect.

Set 1: Belief in Head. Belief in head reported at Trial 1 significantly predicted changes in self-compassion ($\beta = -0.287$, 96.7% CI [-0.597, -0.032], $R^2_{change} = .077$), self-esteem ($\beta = -0.330$, 98.3% CI [-0.189, -0.021], $R^2_{change} = .102$), and DASS-42 Depression ($\beta = 0.266$, 95% CI [0.028, 0.260], $R^2_{change} = .066$). Inspection of standardized residual plots revealed possible nonlinearity in the model predicting self-esteem, and so a polynomial model was tested but was not significant after applying the Benjamini-Hochberg correction

($F(4, 52) = 2.781$, $p = .036 > \alpha = .017$, $R^2 = 0.176$). These results indicate that higher levels of belief in head are associated with negative change in self-compassion and self-esteem, and positive change in DASS-42 Depression. Thus, although a significant effect of belief was found, the direction of the effect was in the opposite direction as hypothesized, with greater levels of belief being associated with poorer outcomes. However, although these effects are significant even after controlling for Type I error, belief does not account for a large proportion of the variance in any of the outcome variables.

Set 2: Belief in Heart. Belief in heart reported at Trial 1 significantly predicted changes in self-compassion ($\beta = -0.376$, 98.3% CI [-0.700, -0.119], $R^2_{change} = .131$) and self-esteem ($\beta = -0.366$, 96.7% CI [-0.183, -0.025], $R^2_{change} = .124$). These results are consistent with those found for belief in head, with higher levels of belief being associated with negative changes in self-compassion and self-esteem.

Hypothesis 2. As hypothesized, belief in heart was a better predictor than belief in head for change in self-compassion ($\beta_{heart} = -0.376$ vs. $\beta_{head} = -0.287$) and self-esteem ($\beta_{heart} = -0.366$ vs. $\beta_{head} = -0.330$). However, contrary to expectation, belief in head was a better predictor of change in DASS-42 Depression ($\beta_{head} = 0.266$ vs. $\beta_{heart} = 0.175$). On average, however, there was little difference between ratings of belief in head and belief in heart ($M_{head\text{-}heart} = 2.2$), with a significantly greater difference for those reporting below median belief ($M_{below} = 4.484$, $M_{above} = -0.004$, $t(55) = -2.527$, $p=0.014$).

Due to the high intercorrelation between belief in head and belief in heart, exploratory analyses were conducted in which both measures of belief were entered into a single regression equation, with average effort and difficulty as covariates, in order to assess whether they predicted outcome when controlling for shared variance (see

Appendix I, Table I1). Belief in heart was found to uniquely predict a decrease in self-compassion (β= -.363, t(52)= -1.796, 95% CI [-0.762, -0.076]), and belief in head uniquely predicted increase in rumination (β= .409, t(52)= 1.975, 95% CI [0.081, 0.555]).

Hypothesis 3. Mediation regression analyses with 5000 bootstrap samples were used to determine whether belief mediates the relationship between effort and outcome. Belief and effort were averaged across trials to obtain a single value for each. To limit the likelihood of Type I error, only those outcome variables that were significantly predicted by belief are considered here, and the measure of belief used ('in head' or 'in heart') is that which best predicted outcome. Accordingly, three models were examined (see Figure 1): belief in heart mediating the effect of effort on change in both self-esteem and self-compassion, and belief in head mediating the effect of effort on change in DASS-42 Depression.

Results did not support the hypothesis that belief would mediate the effect of effort on outcome, as the indirect effect of effort was not significant for any of the three models (see Table 6). Exploratory analyses in which average belief in heart was entered as the independent variable and effort as the mediating variable produced no significant results (all p-values > α=0.05).

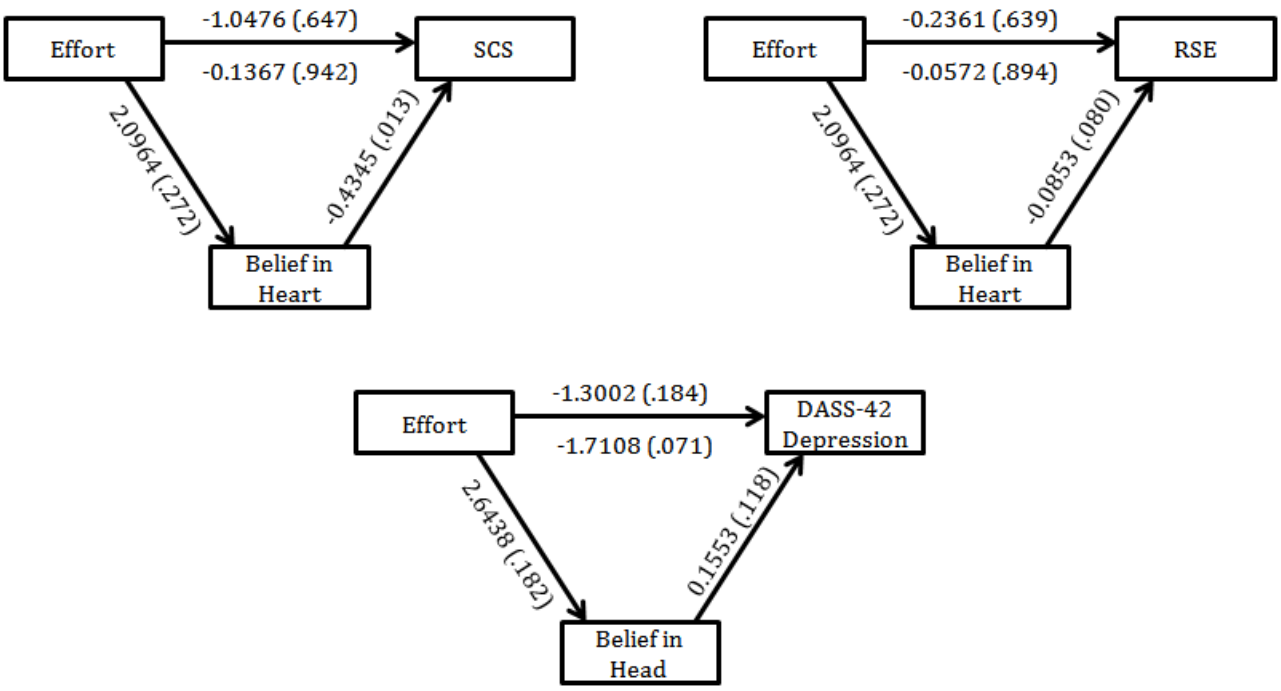

Figure 1. Effect of effort on outcome, mediated by belief.

Table 6

Mediation regression analysis results for hypothesis 3.

IV	DV	M	Indirect Effect	Bootstrap 95% CI
Effort	SCS	Belief in Heart	-.9109	[-3.4188, 0.3576]
	RSE	Belief in Heart	-.1789	[-0.6554, 0.0943]
	DASS-42 Depression	Belief in Head	.4106	[-0.1319, 1.4784]

Hypothesis 4. As with hypothesis 3, mediation regression analyses with 5000 bootstrap samples were used to determine whether belief mediates the relationship between difficulty and outcome. Belief and difficulty were averaged across trials to obtain a single value for each. To limit the likelihood of Type I error, only those outcome variables that were significantly predicted by belief are considered here, and the measure of belief

used ('in head' or 'in heart') is that which best predicted outcome. Accordingly, three models were examined (see Figure 2): belief in heart mediating the effect of difficulty on change in both self-esteem and self-compassion, and belief in head mediating the effect of difficulty on DASS-42 Depression.

Results supported the hypothesis that belief mediates the effect of difficulty on outcome, as the indirect effect of difficulty was significant for all three models (see Table 7). Thus, although difficulty does not significantly predict outcome, it does do so indirectly through its relationship with belief, with greater difficulty being associated with less belief, and thus better outcomes. Exploratory analyses in which average belief in heart was entered as the independent variable and difficulty as the mediating variable produced no significant results (all p-values > α=0.05).

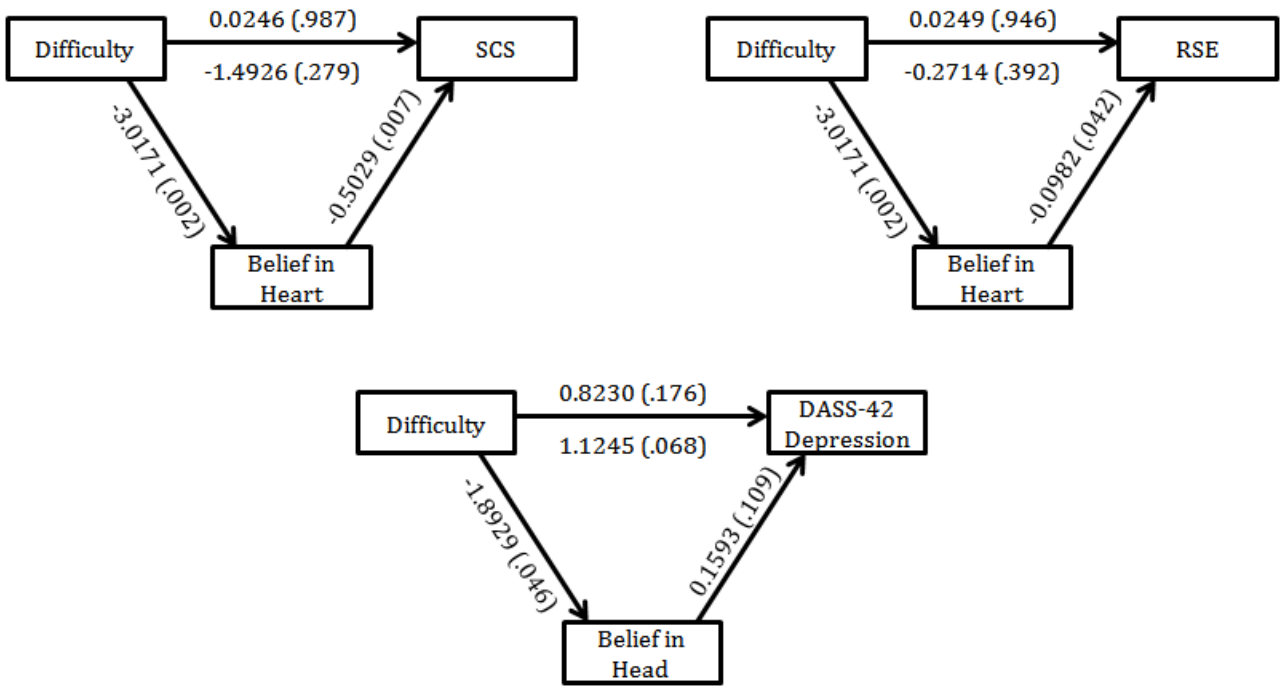

Figure 2. Effect of difficulty on outcome, mediated by belief.

Table 7

Mediation regression analysis results for hypothesis 4.

IV	DV	M	Indirect Effect	Bootstrap 95% CI
Difficulty	SCS	Belief in Heart	1.5172	[0.3781, 3.1654]
	RSE	Belief in Heart	.2962	[0.0575, 0.6763]
	DASS-42 Depression	Belief in Head	-.3015	[-0.7208, -0.0009]

Hypothesis 5. To determine whether the association between shame and negative affect decreased with practice with the self-compassion writing task, I correlated shame intensity ratings with ratings of negative affect obtained following shame recall for each of the three trials. As shown in Table 8, the correlation obtained for Trial 1 was higher than those for Trials 2 and 3, although this difference was not significant at $\alpha = 0.05$ ($Z_{T1 \text{ vs. } T2} = 0.855$, $p = 0.393$; $Z_{T1 \text{ vs. } T3} = 0.632$, $p = 0.527$). Using the median Trial 1 belief in heart of 88 to divide participants into higher and lower belief groups, we can see that, contrary to expectation, the association between shame and negative affect does appear to vary with belief. For those participants reporting above median belief, the expected result is found: the correlation between shame intensity and negative affect decreases across trials, although due to small sample size the effect is not significant ($Z_{T1 \text{ vs. } T2} = 1.014$, $p = 0.311$; $Z_{T1 \text{ vs. } T3} = 1.836$, $p = 0.066$). In contrast, for those reporting below median belief, the opposite effect is observed: the correlation between shame intensity and negative affect increases across trials, although again the effect is not significant due to small sample size ($Z_{T1 \text{ vs. } T2} = -0.279$, $p = 0.780$; $Z_{T1 \text{ vs. } T3} = -1.502$, $p = 0.133$). In general, those reporting lower belief also reported more intense negative affect, as indicated by correlations between

average belief in heart and both average pre-task negative affect (r = -0.267, p=0.044) and average post-task negative affect (r = -0.333, p=0.011).

Table 8

Correlation between shame intensity and negative affect following shame recall.

Sample	Trial 1	Trial 2	Trial 3
Full (N=57)	.430	.287	.326
Above Median Belief (N=29)	.528	.297	.078
Below Median Belief (N=28)	.302	.372	.627

Hypothesis 6. Repeated measures t-tests with 5000 bootstrap samples were used to determine whether the self-compassion writing task produced an immediate decrease in negative affect. To control Type I error, the Benjamini-Hochberg procedure was used. As shown in Table 9, the hypothesis was not supported, as negative affect did not significantly decrease on any of the three trials.

Table 9

Comparison of negative affect scores before and after completing the self-compassion writing task.

	Trial	Mean	Standard Deviation	N	t	i	α = [i/3]0.05	Bootstrap (1-α)% CI
1	Pre-task	45.96	21.14	57	1.377	2	.033	[-0.982, 3.772]
	Post-task	44.44	21.64	57				
2	Pre-task	41.68	15.92	57	1.754	1	.017	[-0.561, 4.053]
	Post-task	39.98	15.38	57				
3	Pre-task	43.67	15.15	57	1.217	3	.050	[-0.543, 2.719]
	Post-task	42.63	16.19	57				

Exploratory Analyses

Research Question 1. To determine whether cognitive reappraisal self-efficacy predicted outcome, change in self-compassion and DASS-42 Depression were regressed on each of baseline CRSE and change in CRSE, using 5000 bootstrap samples. Results indicated that neither measure of CRSE significantly predicted outcome (see Table 10).

Table 10

Predicting outcome with cognitive reappraisal self-efficacy.

IV	DV	R^2	β	Bootstrap 95% CI
Baseline CRSE	ΔSCS	.000	-0.260	[-4.428, 3.083]
	ΔDASS-42 Depression	.012	0.663	[-0.989, 2.220]
ΔCRSE	ΔSCS	.022	2.293	[-2.331, 8.043]
	ΔDASS-42 Depression	.017	-0.979	[-3.020, 1.149]

Research Question 2. Due to very few participants reporting belief levels of 50 or lower (n=3), I was unable to compare the effect on outcome of belief versus disbelief. Accordingly, participants were instead divided into groups of lower and higher belief with the cutoff at the median Trial 1 belief in heart value of 88. Correlations between belief, both 'in heart' and 'in head', and outcome were calculated for both belief groups (see Table 11). These results indicate that, in general, the effect of belief on outcome is stronger for those in the higher belief group, although there were no statistically significant differences between the correlations at $\alpha=0.05$. Given the negative correlation between belief and outcome, independent samples t-tests were conducted to determine if there was a significant difference between the lower and higher belief groups in outcome. Results

showed significantly greater improvement in self-compassion (M_{low} = 6.02, M_{high} = -2.72, t(55)= -2.445, 95% CI [-15.91, -1.58]) and self-esteem (M_{low} = 2.11, M_{high} = -0.10, t(55)= -2.584, 95% CI [-3.92, -0.50]) in the lower belief group. Thus, those reporting below median belief showed significantly greater increases in self-compassion and self-esteem when compared to those reporting above median belief.

Table 11

Comparison of belief-outcome non-parametric correlations for lower and higher belief groups.

	Belief ≤ 88 (n=28)		Belief > 88 (n=29)	
	T1 Belief in Heart	T1 Belief in Head	T1 Belief in Heart	T1 Belief in Head
ΔSCS	-.227	-.128	-.159	-.014
ΔBDI	-.059	-.115	-.103	.337
ΔDASS Depression	.026	.106	.323	.111
ΔRSE	-.111	-.186	-.252	-.289
ΔShame	-.066	-.202	.140	.217
ΔGuilt	-.142	-.138	.313	.369*
ΔDetachment	.058	.212	.174	.279
ΔExternalisation	-.075	.178	.384*	.487**
ΔPride A	-.190	-.159	.197	-.090
ΔPride B	-.082	-.446*	.164	-.146
ΔRRS	.006	.098	-.046	.176

Note: Shame, guilt, detachment, externalisation, pride A, and pride B refer to TOSCA-3 subscales.
* $p < 0.05$. ** $p < 0.01$.

Research Question 3. One-way repeated measures ANOVAs were conducted to determine whether belief, effort, or task difficulty changed across trials. Results indicate that there was no change in any of these variables across the three trials (see Table 12). However, pairwise comparisons of values at Trial 1 and Trial 3 show that task difficulty

significantly decreases (t(56)=2.746, p=.008), and belief in head significantly increases (t(56)=-2.116, p=.039) at α=0.05.

Table 12

Change in belief, effort and difficulty across trials.

	Trial 1 mean	Trial 2 mean	Trial 3 mean	F	d.f.	Sig.
Belief in head	86.88	90.60	90.02	1.445	2, 168	.239
Belief in heart	84.58	88.57	87.75	1.197	2, 168	.305
Effort	5.46	5.53	5.37	0.259	2, 168	.772
Difficulty	4.56	4.40	3.98	1.653	2, 168	.194

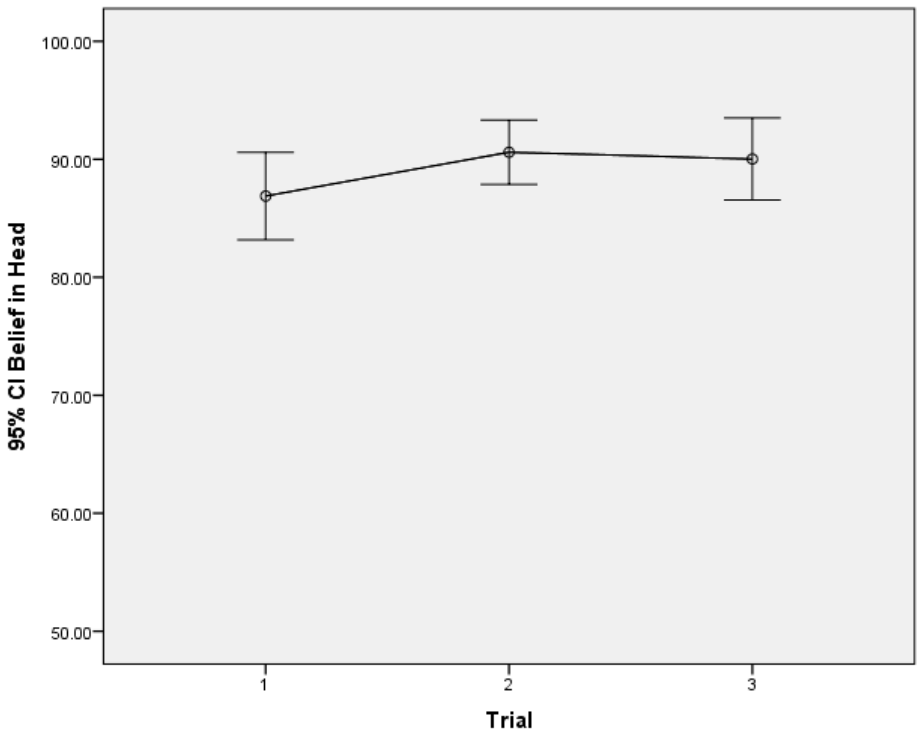

Figure 3. Change in belief in head across trials.

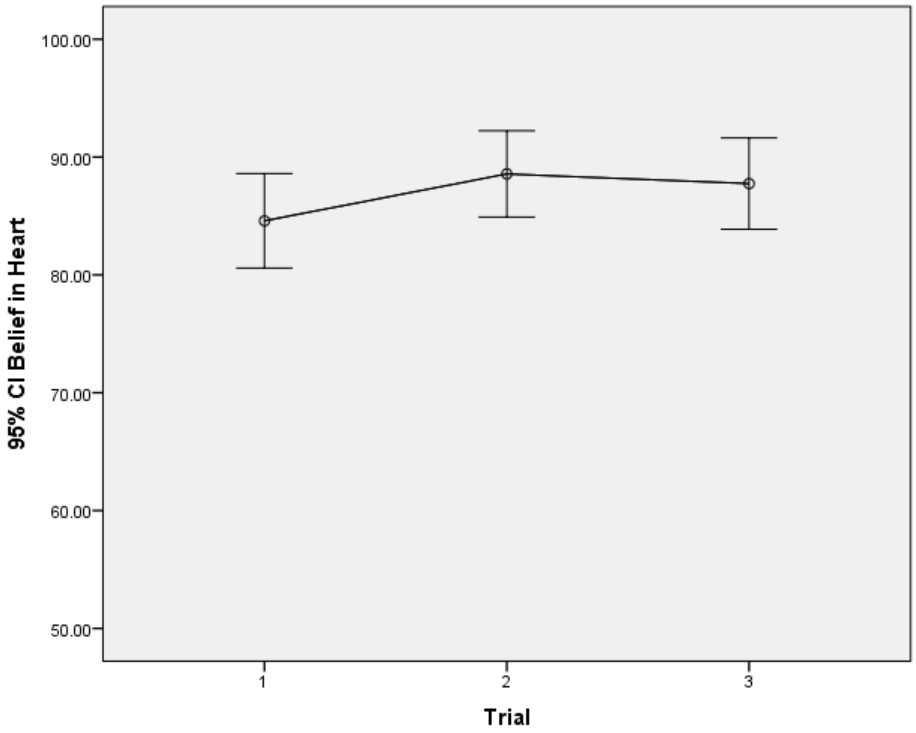

Figure 4. Change in belief in heart across trials.

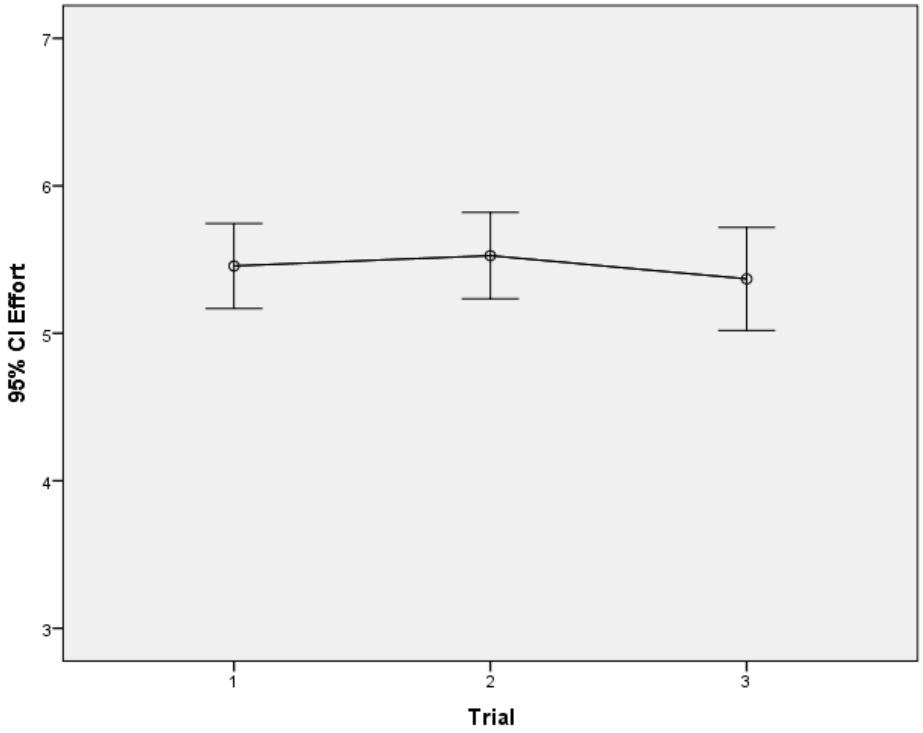

Figure 5. Change in effort across trials.

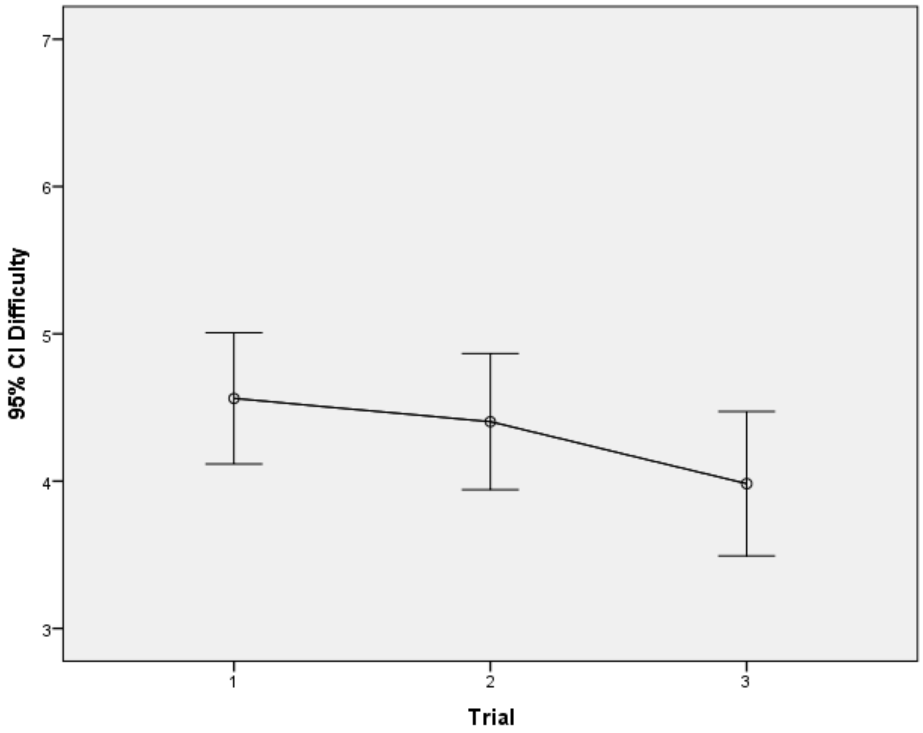

Figure 6. Change in task difficulty across trials.

Research Question 4. To determine whether the three components of self-compassion differentially predicted outcome, I performed two sets of regression analyses, each with 5000 bootstrap samples. The first used Trial 1 self-kindness, mindfulness, and common humanity belief in head as predictors, and the second used Trial 1 self-kindness, mindfulness, and common humanity belief in heart as predictors.

Set 1: Belief in head. Lower levels of Trial 1 self-kindness belief in head uniquely predicted increases in self-compassion (β= -0.303, p=0.012) and self-esteem (β= -0.103, p=0.009), over and above the effects of mindfulness and common humanity belief. Additionally, higher levels of Trial 1 common humanity belief in head uniquely predicted an increase in TOSCA-3 Detachment (β= .099, p=0.004).

Set 2: Belief in heart. Lower levels of Trial 1 self-kindness belief in heart uniquely predicted a decrease in self-esteem (β= -0.062, p=0.042), over and above the effects of mindfulness and common humanity belief.

It has been argued that self-esteem maintains well-being in a manner that competes with the effect of self-compassion, and thus that the effects of a self-compassion intervention should control for the influence of baseline self-esteem (Johnson & O'Brien, 2013; Leary et al., 2007). Accordingly, the analyses for hypotheses 1, 3 and 4, as well as for research question 4 were re-run, entering RSE scores at baseline as a covariate. These results are presented in Appendix J.

Effect of change in belief. Change in belief in heart from Trial 1 to Trial 3 was found to be negatively correlated with Trial 1 belief in heart ($\rho = -.564$, $p<0.001$). This appears to largely reflect a ceiling effect on belief scores, whereby only lower scores can rise. As shown in Figure 7, most participants increase in belief to some degree, and this increase is larger for those whose Trial 1 belief is lower. On account of this relationship, and in order to better understand the unexpected negative relationship between belief and outcome, I looked at the relationship between change in belief and outcome. Non-parametric correlations between change in belief and the outcome variables showed the expected relationship of increasing belief being associated with greater improvement. Although none of the correlations with change in belief reached statistical significance at $\alpha = 0.05$ for the full sample, those with change in SCS, BDI, and DASS-42 depression, anxiety and stress are significant when only looking at those who reported an increase in belief (see Table 13). Further, considering only those participants who changed their belief rating by at least 5% from Trial 1 to Trial 3, an analysis using 10000 bootstrap samples

found a significant increase in self-compassion and self-esteem for those who increased, while those who decreased showed no change in either measure (see Table 14). Although independent samples t-tests showed no significant differences between these two groups, as shown in Table 14, the small sample sizes resulted in very low power.

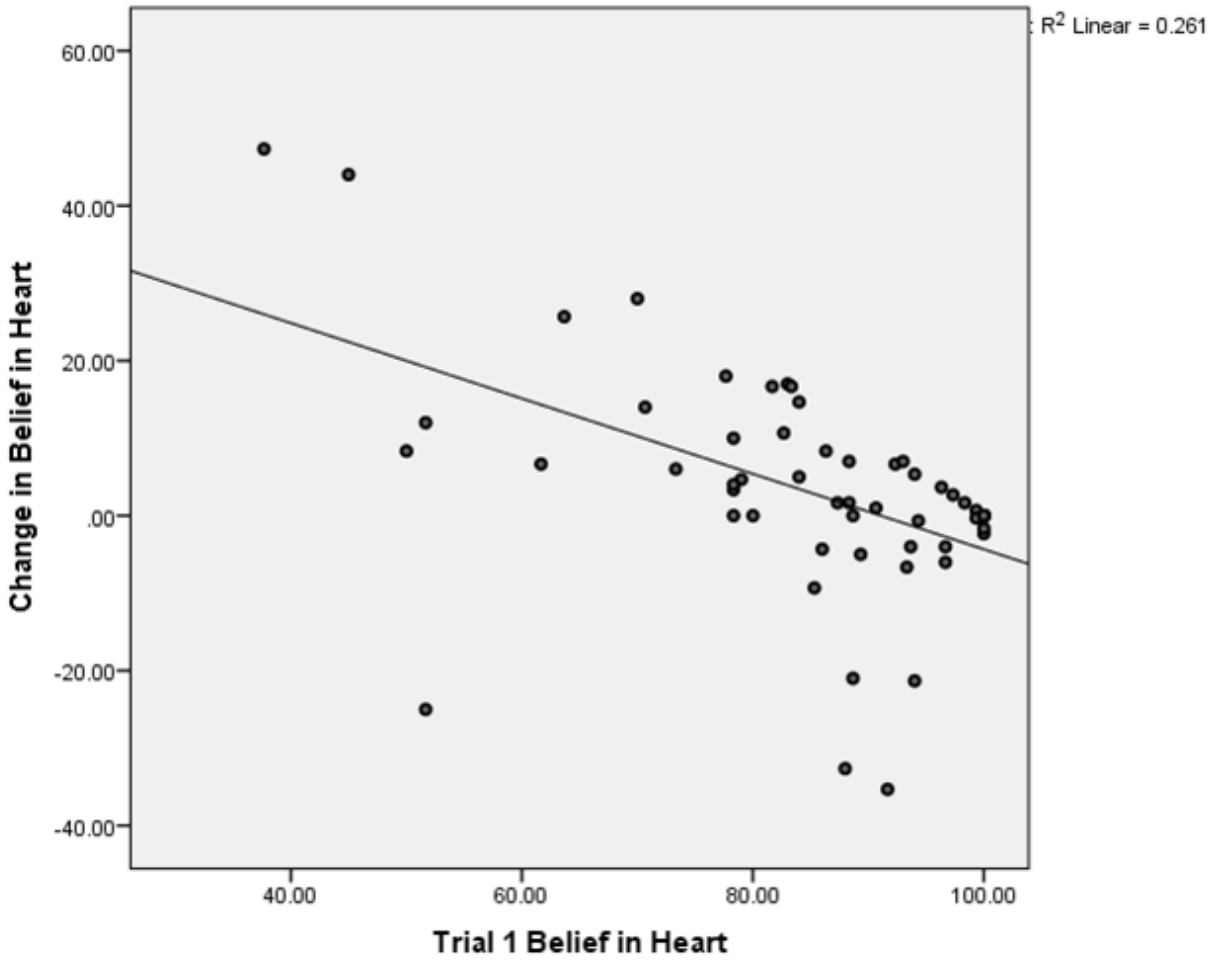

Figure 7. Change in belief in heart as a function of Trial 1 belief.

Table 13
Non-parametric correlations between change in belief in heart and outcome.

Outcome	Full sample (N=57)	Sig.	Increased belief sample (N=32)	Sig.
ΔSCS	0.250	0.061	0.418	0.017
ΔRSE	0.147	0.274	0.196	0.283
ΔBDI	0.012	0.927	-0.382	0.031
ΔDASS-42 Depression	-0.145	0.282	-0.515	0.003
ΔDASS-42 Anxiety	-0.103	0.447	-0.352	0.048
ΔDASS-42 Stress	-0.043	0.752	-0.478	0.006
ΔTOSCA-3 Shame	-0.058	0.671	-0.340	0.057
ΔRRS	-0.129	0.341	-0.174	0.340

Table 14
Difference in outcome for those who increased vs. decreased in belief.

Outcome	ΔBelief Group	N	Mean	t	Bootstrap 95% CI	Effect Size	Power
ΔSCS	Increase	21	6.1695 *	-1.465	[-19.376, 2.020]	0.584	.293
	Decrease	9	-1.8889				
ΔRSE	Increase	21	1.9524 *	-1.102	[-4.031, 0.500]	0.577	.288
	Decrease	9	0.2222				
ΔShame	Increase	21	0.0000	-0.846	[-6.893, 2.750]	0.339	.130
	Decrease	9	-2.0333				
ΔRRS	Increase	21	-2.3810	0.644	[-5.000, 9.750]	0.277	.103
	Decrease	9	0.4444				
ΔCRSE	Increase	21	0.1286	-1.213	[-0.815, 0.096]	0.548	.264
	Decrease	9	-0.2000				

* $p < 0.05$, based on 10000 bootstrap samples.

DISCUSSION

This study was the first to examine a possible mechanism by which a writing task designed to increase self-compassion works. I investigated the role of belief in predicting task efficacy, using two measures of belief: 'belief in heart' and 'belief in head'. I made this

distinction because "belief" can be interpreted in multiple ways, and I wanted to obtain a consistent measure of the degree to which participants *felt* the self-compassionate perspectives to be true, not simply the degree to which they could understand or see the rationale for those perspectives. Accordingly, I expected that belief in head ratings would be higher than belief in heart. However, I found that on average, although belief in head scores were significantly higher ($t(56)=2.367$, $p=.021$), the magnitude of the difference was only 2.2 percentage points, and the two measures were highly correlated ($r=.819$, $p<.001$). This finding somewhat undermines the assumption that these two items measured meaningfully different constructs. It is possible that this may be a result of there being relatively little at stake for participants in the present study. As mentioned earlier, in clinical practice such a distinction is often relevant. For example, when challenging unrealistic thinking, a client may be able to appreciate the rationale behind an alternative perspective, but yet be unable to use it to change how they feel. In such a situation, the client may have much invested in their current way of thinking, making it difficult to change regardless of how reasonable an alternative may seem. In the present study, which used an undergraduate student sample, participants may have had relatively little invested and thus little to lose by adopting a more self-compassionate perspective, making the distinction between "seeming reasonable" and "feeling true" not as meaningful as it might be in a clinical setting. However, as shown in Appendix I, there were two significant unique effects found when entering both belief in head and belief in heart into the regression equation at the same time. Belief in heart predicted a decrease in self-compassion over and above the effect of belief in head, and belief in head uniquely predicted an increase in

rumination. These results suggest that the two measures of belief were not measuring exactly the same thing, despite their high intercorrelation.

Further, belief scores overall were much higher than expected. This is a positive finding, from a clinical perspective, as even those with low baseline self-compassion reported finding the self-compassionate perspectives very believable, suggesting that the task has very good face validity for participants. However, this also resulted in a ceiling effect for belief scores, with the majority of participants reporting belief greater than 85/100. This suggests that belief may be less of a hurdle in the self-compassion writing task than was supposed. However, given that the distributions of belief scores deviated markedly from what was expected, and that belief was the primary independent variable used in testing the hypotheses, the results must be interpreted with caution.

Despite these limitations, several interesting findings emerged from the results. First, participant belief in the self-compassionate perspectives they generated was found to predict change in self-compassion, self-esteem and DASS-42 depression. Although it was expected that belief would predict outcome, the direction of the effect was opposite to that expected, with greater belief being associated with less, not more, improvement. Second, comparing individuals reporting above-median levels of belief to those reporting below-median belief, I found that those with higher belief reported less improvement and stronger negative correlations between belief and outcome.

Another difference between the two belief groups was in the experience of negative affect. Those reporting lower belief reported more intense negative affect, as well as a different pattern in the relationship between shame intensity and affect. Those in the higher belief group showed the expected pattern, in which the correlation between shame

and negative affect decreased in strength across trials. On the other hand, the lower belief group showed the opposite effect, with shame intensity becoming more strongly related to negative affect from Trial 1 to Trial 3. These results may reflect greater emotional engagement among those reporting lower levels of belief. Similarly, those reporting below median belief showed a significant difference in their ratings of belief in head and heart, whereas those reporting above median belief did not. This suggests that those reporting lower levels of belief may have been more emotionally engaged with the task and more aware of their feelings. This may have enabled them to draw a distinction between what they thought and how they felt – a distinction that would not be as apparent to participants engaging more superficially in the task. Indeed, the Elaboration Likelihood Model of persuasion suggests that when personal relevance is low, argument cogency is less important than more superficial features of an argument (Petty et al., 1992). Further, neuroimaging research has shown that efficacy of an exposure-based CBT intervention is predicted by greater pre-treatment activation in areas involved with threat processing, such as insula and dorsolateral prefrontal cortex, possibly reflecting the importance of activating a detailed cognitive representation of the fear experience (Reinecke, Thilo, Filippini, Croft, & Harmer, 2014). Accordingly, it is possible that participants who did not experience as much emotional engagement with the task may have paid less attention to the content of their self-compassionate compositions, resulting in a lack of discrimination between what *seems true* and what *feels true*, and thus both leading to them reporting a similarly high degree of belief 'in head' and 'in heart', as well as to less improvement.

In order to better understand the unexpected negative effect of belief, I looked at the relationship between belief, change in belief, and outcome. It was found that lower Trial 1

belief was associated with a greater increase in belief across the trials. Unlike those between belief and outcome, the correlations between change in belief and change in self-compassion, self-esteem, DASS-42 depression, and rumination were in the expected direction of increasing belief being associated with greater improvement. Further, those who increased in belief showed a significant increase in self-compassion and self-esteem, while those who decreased did not.

It was hypothesized that if belief predicted outcome, this would lend some support to the argument that the self-compassion writing task encourages cognitive reappraisal of distressing thoughts, as opposed to relying on mechanisms such as extinction that do not require conscious processes. The reasoning behind this hypothesis was that reappraisal of an experience is unlikely to be helpful unless a person believes the new interpretation. Thus, higher belief was expected to be associated with greater improvement. However, it was also hypothesized that the difference may be limited to belief versus disbelief, with degree of belief not being associated with degree of improvement. I was unable to test this hypothesis, due to very few participants reporting disbelief (i.e. belief lower than 50). Nonetheless, it would be expected that if this were true, I should have found no effect of belief in our sample, yet I observed a significant negative effect.

The results indicate that those with below median belief showed greater increases in belief, as well as greater improvement in well-being, despite reporting more intense negative affect that became more strongly tied to the experience of shame over time. A possible interpretation of these results is that, while some level of belief is necessary for task efficacy, very high initial belief may preclude reappraisal, and thus improvement in well-being. Cognitive reappraisal involves the conscious reinterpretation of an experience

that alters its emotional impact. If belief in an interpretation is already very high (i.e. around 90/100 or higher), it would make sense that reappraisal would not occur, since there is little discrepancy between the old and new interpretations. If this is the case, then it would be expected that the extent to which belief increases, rather than absolute degree of belief, should predict outcome. Comparing the results presented in Table 5 to those in Table 13, it can be seen that, for those who increase in belief, the correlations are indeed stronger for change in belief.

However, there are several problems with this interpretation. First, if cognitive reappraisal were responsible for task efficacy, then cognitive reappraisal self-efficacy should predict outcome, but it did not. Second, only a very small proportion of participants reported low levels of belief. Together with the small effect sizes observed, this undersampling raises the possibility that a very different relationship might exist between belief and outcome that is not captured when only looking at those with high belief. Indeed, the negative effect of belief was found to differ between those reporting very high belief and those reporting moderately high belief. Nearly all participants who reported belief below 75/100 also reported improvement in well-being, but there are only 10 participants in this group. If this sample of 10 is biased, such that more extensive sampling would lead to a lower proportion that improve, this would likely eliminate the observed effect of belief on outcome. However, it is important to note that the strongest effect of belief was for the very high belief group, which did not suffer from undersampling.

Another problem with the interpretation is that the observed effect of belief could be partly accounted for by regression to the mean, which is the tendency for extreme scores to become less extreme on re-testing, and vice versa. This was partly controlled for

by removing participants who scored more than three standard deviations from the mean on any outcome variable. However, baseline scores were found to be negatively correlated with change scores, and greater baseline well-being was associated with greater belief at Trial 1. Indeed, those reporting below-median belief significantly improved on several outcome measures, while those reporting above-median belief did not. Importantly, however, those in the latter group did not decrease in well-being. If regression to the mean were solely responsible, there should be relatively symmetric improvement and deterioration for those below and above the mean, respectively. Further, although Trial 1 belief was associated with baseline well-being, change in belief was only very weakly related to baseline scores.

An alternative explanation for the observed results is that greater emotional engagement with the task may have led to greater effort, which together may have led both to lower belief and to better outcomes. Looking at the content of the self-compassionate compositions, many were short and vague (e.g. "I'm sure it'll be better next time just study a little more and I'm sure it'll go better than it did this time."), making them relatively easy to agree with. Accordingly, more complex responses, likely reflecting greater effort, may have been less believable, particularly for participants experiencing more intense negative affect. Since practice with the task is believed to increase efficacy (Johnson & O'Brien, 2013), such effortful engagement may have led to better outcomes for these participants. However, neither self-reported effort nor average length of the self-compassionate compositions were associated with significantly greater negative affect. Also, as shown in Figure 1, self-reported effort was not associated with greater improvement.

Limitations

One of the most significant limitations of this study is its correlational nature. Its purpose was to examine a possible mechanism by which a writing task increases self-compassion, but although several effects of belief on outcome were significant, it cannot be concluded that belief *causes* the outcomes, merely that they are associated with one another. It also cannot prove that the writing task is effective, due to the lack of a control group. Although previous research has found the task to be effective (Johnson & O'Brien, 2013), this may not have held true for the current sample. If the task was not effective (i.e. responsible for the observed improvements in well-being), this would substantially interfere with my efforts to understand the mechanism of its effect.

Another limitation of the study is that it relies exclusively on self-report measures. One problem with this is that some participants may have put little effort into their responses, adding variability not related to the task and obscuring its effects. Additionally, reliance on self-report measures can lead to mono-method bias (McKay, 2008), the consequence of which could be an inflation of the correlations between measures, and thus Type I error rate, as a result of shared method variance. Unfortunately, since the study is administered online, this was unavoidable. On the other hand, the pre-experimental design, which used non-fixed independent variables, may have led to biased slope estimates that were smaller than they should have been. Internal validity may also be compromised by limited variability among belief scores, again leading to an underestimation of correlations, and thus increased Type II error. Indeed, many analyses were limited by high Type II error and low power, in part due to small sample sizes, particularly in the lower belief group. The use of undergraduate psychology students may

have contributed to the reduced score variability due to sample homogeneity. This sample also poses a threat to external validity, since they were younger and included a higher proportion of females than the general population. Finally, although reported task difficulty was expected to largely reflect how difficult it was to think of a self-compassionate perspective, it could also have been affected by mechanical writing problems.

Given these limitations, future research should employ an experimental design, manipulating believability of self-compassionate perspectives and including control conditions. It is important that future research make believability more challenging in order to avoid the ceiling effect observed in the present study, and to assess whether the observed effects would hold for those reporting low belief. However, given the generally small effects found in the present study, including the small proportion of variance in outcome accounted for by belief, future research that investigates other potential mediators of task efficacy may be more worthwhile. For example, although a detailed investigation of the content of the self-compassion essays composed by participants is beyond the scope of the present study, a cursory investigation suggested that participants may not have fully understood what was expected of them, particularly with regard to the common humanity essays. If participants do not complete the task properly, efficacy is likely to be limited. Thus, future research should evaluate alternative prompts in order to more effectively induce self-compassion.

Conclusions

The present study suggests that belief in a self-compassionate interpretation of a shameful experience impacts the effectiveness of that interpretation for improving well-being. In particular, the degree to which such interpretations become more believable with time and practice was found to be associated with degree of improvement. This suggests that modifications to the self-compassion writing task in order to increase the persuasiveness of self-compassionate perspectives may be warranted. However, belief accounted for only a small proportion of the variance in outcome, suggesting that future research may be able to identify more worthwhile targets for increasing task efficacy.

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APPENDIX A

Self-Compassion Scale

1. I try to be understanding and patient towards those aspects of my personality I don't like.
2. I'm kind to myself when I'm experiencing suffering.
3. When I'm going through a very hard time, I give myself the caring and tenderness I need.
4. I'm tolerant of my own flaws and inadequacies.
5. I try to be loving towards myself when I'm feeling emotional pain.
6. When I see aspects of myself that I don't like, I get down on myself.
7. When times are really difficult, I tend to be tough on myself.
8. I can be a bit cold-hearted towards myself when I'm experiencing suffering.
9. I'm disapproving and judgemental about my own flaws and inadequacies.
10. I'm intolerant and impatient towards those aspects of my personality I don't like.
11. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
12. I try to see my failings as part of the human condition.
13. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.
14. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
15. When I fail at something that's important to me I tend to feel alone in my failure.
16. When I think about my inadequacies it tends to make me feel more separate and cut off from the rest of the world.
17. When I'm feeling down I tend to feel like most other people are probably happier than I am.
18. When I'm really struggling I tend to feel like other people must be having an easier time of it.
19. When something upsets me I try to keep my emotions in balance.
20. When I'm feeling down I try to approach my feelings with curiosity and openness.
21. When something painful happens I try to take a balanced view of the situation.
22. When I fail at something important to me I try to keep things in perspective.
23. When something upsets me I get carried away with my feelings.
24. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
25. When something painful happens I tend to blow the incident out of proportion.
26. When I fail at something important to me I become consumed by feelings of inadequacy.

APPENDIX B

Beck Depression Inventory

1.	0	I do not feel sad.
	1	I feel sad
	2	I am sad all the time and I can't snap out of it.
	3	I am so sad and unhappy that I can't stand it.
2.	0	I am not particularly discouraged about the future.
	1	I feel discouraged about the future.
	2	I feel I have nothing to look forward to.
	3	I feel the future is hopeless and that things cannot improve.
3.	0	I do not feel like a failure.
	1	I feel I have failed more than the average person.
	2	As I look back on my life, all I can see is a lot of failures.
	3	I feel I am a complete failure as a person.
4.	0	I get as much satisfaction out of things as I used to.
	1	I don't enjoy things the way I used to.
	2	I don't get real satisfaction out of anything anymore.
	3	I am dissatisfied or bored with everything.
5.	0	I don't feel particularly guilty
	1	I feel guilty a good part of the time.
	2	I feel quite guilty most of the time.
	3	I feel guilty all of the time.
6.	0	I don't feel I am being punished.
	1	I feel I may be punished.
	2	I expect to be punished.
	3	I feel I am being punished.
7.	0	I don't feel disappointed in myself.
	1	I am disappointed in myself.
	2	I am disgusted with myself.
	3	I hate myself.
8.	0	I don't feel I am any worse than anybody else.

1 I am critical of myself for my weaknesses or mistakes.
2 I blame myself all the time for my faults.
3 I blame myself for everything bad that happens.

9. 0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.

10. 0 I don't cry any more than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't cry even though I want to.

11. 0 I am no more irritated by things than I ever was.
1 I am slightly more irritated now than usual.
2 I am quite annoyed or irritated a good deal of the time.
3 I feel irritated all the time.

12. 0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.

13. 0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions more than I used to.
3 I can't make decisions at all anymore.

14. 0 I don't feel that I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel there are permanent changes in my appearance that make me look unattractive
3 I believe that I look ugly.

15. 0 I can work about as well as before.
1 It takes an extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.

16. 0 I can sleep as well as usual.
    1 I don't sleep as well as I used to.
    2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
    3 I wake up several hours earlier than I used to and cannot get back to sleep.

17. 0 I don't get more tired than usual.
    1 I get tired more easily than I used to.
    2 I get tired from doing almost anything.
    3 I am too tired to do anything.

18. 0 My appetite is no worse than usual.
    1 My appetite is not as good as it used to be.
    2 My appetite is much worse now.
    3 I have no appetite at all anymore.

19. 0 I haven't lost much weight, if any, lately.
    1 I have lost more than five pounds.
    2 I have lost more than ten pounds.
    3 I have lost more than fifteen pounds.

20. 0 I am no more worried about my health than usual.
    1 I am worried about physical problems like aches, pains, upset stomach, or constipation.
    2 I am very worried about physical problems and it's hard to think of much else.
    3 I am so worried about my physical problems that I can’t think of anything else.

21. 0 I have not noticed any recent change in my interest in sex.
    1 I am less interested in sex than I used to be.
    2 I have almost no interest in sex.
    3 I have lost interest in sex completely.

APPENDIX C

Depression Anxiety Stress Scales

Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 = Did not apply to me at all
1 = Applied to me to some degree, or some of the time
2 = Applied to me to a considerable degree, or a good part of time
3 = Applied to me very much, or most of the time

1) I found myself getting upset by quite trivial things 0 1 2 3

2) I was aware of dryness of my mouth 0 1 2 3

3) I couldn't seem to experience any positive feeling at all 0 1 2 3

4) I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion) 0 1 2 3

5) I just couldn't seem to get going 0 1 2 3

6) I tended to over-react to situations 0 1 2 3

7) I had a feeling of shakiness (e.g. legs going to give way) 0 1 2 3

8) I found it difficult to relax 0 1 2 3

9) I found myself in situations that made me so anxious I was most relieved when they ended 0 1 2 3

10) I felt that I had nothing to look forward to 0 1 2 3

11) I found myself getting upset rather easily 0 1 2 3

12) I felt that I was using a lot of nervous energy 0 1 2 3

13) I felt sad and depressed 0 1 2 3

14) I found myself getting impatient when I was delayed in any way (e.g. elevators, traffic lights, being kept waiting) 0 1 2 3

15) I had a feeling of faintness 0 1 2 3

16) I felt that I had lost interest in just about everything 0 1 2 3

17) I felt I wasn't worth much as a person 0 1 2 3

18) I felt that I was rather touchy 0 1 2 3

19) I perspired noticeably (e.g. hands sweaty) in the absence of high temperatures or physical exertion 0 1 2 3

20) I felt scared without any good reason 0 1 2 3

21) I felt that life wasn't worthwhile 0 1 2 3

22) I found it hard to wind down 0 1 2 3

23) I had difficulty in swallowing 0 1 2 3

24) I couldn't seem to get any enjoyment out of the things I did 0 1 2 3

25) I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat) 0 1 2 3

26) I felt down-hearted and blue 0 1 2 3

27) I found that I was very irritable 0 1 2 3

28) I felt I was close to panic 0 1 2 3

29) I found it hard to calm down after something upset me 0 1 2 3

30) I feared that I would be "thrown" by some trivial but unfamiliar task 0 1 2 3

31) I was unable to become enthusiastic about anything 0 1 2 3

32) I found it difficult to tolerate interruptions to what I was doing 0 1 2 3

33) I was in a state of nervous tension 0 1 2 3

34) I felt I was pretty worthless 0 1 2 3

35) I was intolerant of anything that kept me from getting on with what I was doing 0 1 2 3

36) I felt terrified 0 1 2 3

37) I could see nothing in the future to be hopeful about 0 1 2 3

38) I felt that life was meaningless 0 1 2 3

39) I found myself getting agitated 0 1 2 3

40) I was worried about situations in which I might panic and make a fool of myself 0 1 2 3

41) I experienced trembling (e.g. in the hands) 0 1 2 3

42) I found it difficult to work up the initiative to do things 0 1 2 3

APPENDIX D

Test of Self-Conscious Affect – 3

Below are situations that people are likely to encounter in day-to-day life, followed by several common reactions to those situations.

As you read each scenario, try to imagine yourself in that situation. Then indicate how likely you would be to react in each of the ways described. We ask you to rate *all* responses because people may feel or react more than one way to the same situation, or they may react different ways at different times. To rate the responses use the following scale:

1 - - 2 - - 3 - - 4 - - 5
not likely very likely

For example:

You wake up early one Saturday morning. It is cold and rainy outside.

a) You would telephone a friend to catch up on news __1__
b) You would take the extra time to read the paper. __5__
c) You would feel disappointed that it's raining __3__
d) You would wonder why you woke up so early __4__

In the above example, I've rated *all* of the answers by selecting a number. I selected a "1" for answer (a) because I wouldn't want to wake up a friend very early on a Saturday morning—so it's not at all likely that I would do that. I selected a "5" for answer (b) because I almost always read the paper if I have time in the morning (very likely). I selected "3" for answer (c) because for me it's about half and half. Sometimes I would be disappointed about the rain and sometimes I wouldn't—it would depend on what I had planned. And I selected a "4" for answer (d) because I would probably wonder why I had awakened so early.

Please do not skip any items—rate all responses.

1. *You make plans to meet a friend for lunch. At 5 o'clock, you realize you stood your friend up.*

1 - - 2 - - 3 - - 4 - - 5
not likely very likely

a) You would think: "I'm inconsiderate." _____
b) You would think: "Well, my friend will understand." _____
c) You 'd think you should make it up to your friend as soon as possible. _____

d) You would think: "My boss distracted me just before lunch." _____

2. *You break something at work and then hide it.*

1 - - 2 - - 3 - - 4 - - 5
not likely very likely

a) You would think: "This is making me anxious.
I need to either fix it or get someone else to." _____
b) You would think about quitting. _____
c) You would think "A lot of things aren't made very well these days." _____
d) You would think: "It's only an accident." _____

3. *You are out with friends one evening, and you're feeling especially witty and attractive. Your best friend's romantic partner seems to particularly enjoy your company.*

a) You would think: "I should have been aware of what my best friend was feeling." _____
b) You would feel happy with your appearance and personality. _____
c) You would feel pleased to have made such a good impression. _____
d) You would think your best friend should pay attention to his/her partner. _____
e) You would probably avoid eye contact for a long time. _____

4. *At work, you wait until the last minute to plan a project, and it turns out badly.*

a) You would feel incompetent. _____
b) You would think: "There are never enough hours in the day." _____
c) You would feel: "I deserve to be reprimanded for mismanaging the project." _____
d) You would think: "What's done is done." _____

5. *You make a mistake at work and find out a coworker is blamed for the error.*

a) You would think the company did not like the coworker. _____
b) You would think "Life is not fair." _____
c) You would keep quiet and avoid the coworker. _____
d) You would feel unhappy and eager to correct the situation. _____

6. *For several days you put off making a difficult phone call. At the last minute you make the call and are able to manipulate the conversation so that all goes well.*

a) You would think: "I guess I'm more persuasive than I thought." _____

b) You would regret that you put it off. _____
c) You would feel like a coward. _____
d) You would think "I did a good job." _____
e) You would think you shouldn't have to make calls you feel pressured into. _____

7. *While playing around, you throw a ball and it hits your friend in the face.*

a) You would feel inadequate that you can't even throw a ball. _____
b) You would think maybe your friend needs more practice at catching. _____
c) You would think "It was just an accident." _____
d) You would apologize and make sure your friend feels better. _____

8. *You have recently moved away from your family, and everyone has been very helpful. A few times you needed to borrow money, but you paid it back as soon as you could.*

a) You would feel immature. _____
b) You would think: "I sure ran into some bad luck." _____
c) You would return the favor as quickly as possible. _____
d) You would think: "I am a trustworthy person." _____
e) You would be proud that you repaid your debts. _____

9. *You are driving down the road, and you hit a small animal.*

a) You would think the animal shouldn't have been on the road. _____
b) You would think: "I'm terrible." _____
c) You would feel: "Well, it was an accident." _____
d) You'd feel bad you hadn't been more alert driving down the road. _____

10. *You walk out of an exam thinking you did extremely well. Then you find out you did poorly.*

a) You would think: "Well, it's just a test." _____
b) You would think: "The instructor doesn't like me." _____
c) You would think: "I should have studied harder." _____
d) You would feel stupid. _____

11. *You and a group of coworkers worked very hard on a project. Your boss singles you out for a bonus because the project was such a success.*

a) You would feel the boss is rather short-sighted. _____

b) You would feel alone and apart from your colleagues. _____
c) You would feel your hard work had paid off. _____
d) You would feel competent and proud of yourself. _____
e) You would feel you should not accept it. _____

12. *While out with a group of friends, you make fun of a friend who's not there.*

a) You would think: "it was all in fun; it's harmless" _____
b) You would feel small…like a rat. _____
c) You would think that perhaps that friend should have been there to defend him/herself. _____
d) You would apologize and talk about that person's good points. _____

13. *You make a big mistake on an important project at work. People were depending on you, and your boss criticizes you.*

a) You would think your boss should have been more clear about what was expected of you. _____
b) You would feel like you wanted to hide. _____
c) You would think: "I should have recognized the problem and done a better job." _____
d) You would think: "Well, nobody's perfect." _____

14. *You volunteer to help with the local Special Olympics for handicapped children. It turns out to be a frustrating and time-consuming work. You think seriously about quitting, but then you see how happy the kids are.*

a) You would feel selfish, and you'd think you are basically lazy. _____
b) You would feel you were forced into doing something you did not want to do. _____
c) You would think: "I should be more concerned about people who are less fortunate." _____
d) You would feel great that you had helped others. _____
e) You would feel very satisfied with yourself. _____

15. *You are taking care of your friend's dog while your friend is on vacation and the dog runs away.*

a) You would think: "I am irresponsible and incompetent." _____
b) You would think your friend must not take very good care of the dog or it wouldn't have run away. _____
c) You would vow to be more careful next time. _____

d) You would think your friend could just get a new dog. _____

16. *You attend your coworker's housewarming party and you spill red wine on a new cream-colored carpet, but you think no one notices.*

a) You think your coworker should have expected some accidents to happen at such a big party. _____
b) You would stay late to help clean up the stain after the party. _____
c) You would wish you were anywhere but at the party. _____
d) You would wonder why your coworker chose to serve red wine with the new light carpet. _____

APPENDIX E

Ruminative Responses Subscale

People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do.

1 = almost never
2 = sometimes
3 = often
4 = almost always

1. Think about how alone you feel.
2. Think "I won't be able to do my job if I don't snap out of this"
3. Think about your feelings of fatigue and achiness.
4. Think about how hard it is to concentrate.
5. Think "what am I doing to deserve this?"
6. Think about how passive and unmotivated you feel.
7. Analyze recent events to try to understand why you are depressed.
8. Think about how you don't seem to feel anything anymore.
9. Think "why can't I get going?"
10. Think "why do I always react this way?"
11. Go away by yourself and think about why you feel this way.
12. Write down what you are thinking about and analyze it.
13. Think about a recent situation, wishing it had gone better.
14. Think "I won't be able to concentrate if I keep feeling this way."
15. Think "why do I have problems other people don't have?"
16. Think "why can't I handle things better?"
17. Think about how sad you feel.
18. Think about all your shortcomings, failings, faults, mistakes.
19. Think about how you don't feel up to doing anything.
20. Analyze your personality to try to understand why you are depressed.
21.go someplace alone to think about your feelings.
22. Think about how angry you are with yourself.

APPENDIX F

Rosenberg Self Esteem Scale

Below is a list of statements dealing with your general feelings about yourself.

1 = strongly agree
2 = agree
3 = disagree
4 = strongly disagree

1. On the whole, I am satisfied with myself.

2. At times, I think I am no good at all.

3. I feel that I have a number of good qualities.

4. I am able to do things as well as most other people.

5. I feel I do not have much to be proud of.

6. I certainly feel useless at times.

7. I feel that I'm a person of worth, at least on an equal plane with others.

8. I wish I could have more respect for myself.

9. All in all, I am inclined to feel that I am a failure.

10. I take a positive attitude toward myself.

APPENDIX G

Mood Scale

Using the scale below, please indicate the degree to which each of the following words describes you **at this moment. Right now I feel:**

1 2 3 4 5 6 7
Not at all Extremely

_____ happy	_____ down	_____ irritated	_____ anxious
_____ tense	_____ cheerful	_____ depressed	_____ annoyed
_____ mad	_____ uneasy	_____ delighted	_____ sad
_____ dejected	_____ angry	_____ nervous	_____ pleased

APPENDIX H

Cognitive Reappraisal Self-Efficacy Scale

When answering these questions, please consider the PAST MONTH.

1 2 3 4 5 6 7
Strongly disagree Neutral Strongly agree

When I really want to, I am very capable of …

1. ____ Controlling my emotions by changing the way I think about the situation I'm in.
2. ____ Regulating my emotions by changing what the situation means to me.
3. ____ Making myself think about a stressful situation in a way that helps me stay calm.
4. ____ Changing the way I'm thinking about a situation when I want to feel less negative emotion (such as sadness or anger).
5. ____ Regulating my emotions by adopting a different perspective when I start to feel emotional.
6. ____ Changing the way I am thinking about a situation that is likely to make me feel strong emotions.
7. ____ Reconsidering what relevance the situation really has for me if a situation is likely to make me upset.
8. ____ Regulating my emotions by thinking differently about whatever is making me emotional.

APPENDIX I

Table I1

Unique effects of belief in head and heart.

Outcome	Belief Measure	β	t	Bootstrap 95% CI	Zero-order correlation	Partial Correlation
ΔSCS	Head	-.017	-.084	[-0.340, 0.400]	-.283	-.012
	Heart	-.363	-1.796	[-0.762, -0.076]	-.351	-.242
ΔBDI	Head	.161	.757	[-0.106, 0.257]	.089	.104
	Heart	-.048	-.225	[-0.191, 0.141]	.054	-.031
ΔDASS	Head	.310	1.533	[-0.043, 0.323]	.192	.208
Depression	Heart	-.059	-.290	[-0.180, 0.152]	.108	-.040
ΔRSE	Head	-.132	-.657	[-0.121, 0.074]	-.324	-.091
	Heart	-.267	-1.321	[-0.175, 0.020]	-.345	-.180
ΔTOSCA-3	Head	-.057	-.269	[-0.246, 0.186]	.052	-.037
Shame	Heart	.118	.551	[-0.140, 0.276]	.062	.076
ΔRRS	Head	.409	1.975	[0.081, 0.555]	.126	.264
	Heart	-.384	-1.837	[-0.513, 0.013]	-.053	-.247

Note: Based on 5000 bootstrap samples.

APPENDIX J

Direct and Indirect Effects of Belief, Controlling Baseline RSE

Table J1

Effects of belief in head and heart when controlling for baseline RSE.

Outcome	Belief Measure	β	t	Bootstrap 95% CI	R^2_{change}
ΔSCS	Head	-.294	-2.149	[-0.568, -0.042]	0.081
	Heart	-.373	-2.775	[-0.622, -0.159]	0.128
ΔBDI	Head	.121	0.860	[-0.038, 0.169]	0.014
	Heart	.078	0.543	[-0.060, 0.119]	0.006
ΔDASS	Head	.275	2.065	[0.034, 0.266]	0.071
Depression	Heart	.168	1.221	[-0.018, 0.188]	0.026
ΔRSE	Head	-.370	-3.169	[-0.149, -0.045]	0.128
	Heart	-.333	-2.779	[-0.143, -0.028]	0.102
ΔTOSCA-3	Head	.017	0.125	[-0.126, 0.156]	0.000
Shame	Heart	.088	0.627	[-0.089, 0.162]	0.007
ΔRRS	Head	.116	0.820	[-0.123, 0.333]	0.013
	Heart	-.067	-0.466	[-0.242, 0.194]	0.004

Note: Based on 5000 bootstrap samples.

Table J2

Mediating effect of belief on the relationship between effort and outcome, including baseline RSE as a covariate.

IV	DV	M	Indirect Effect	Bootstrap 95% CI
Effort	SCS	Belief in Heart	-.6199	[-2.9798, 0.6581]
	RSE	Belief in Heart	-.0897	[-0.5189, 0.0703]
	DASS-42 Depression	Belief in Head	.3873	[-0.0858, 1.4691]

Note: Based on 5000 bootstrap samples.

Table J3

Mediating effect of belief on the relationship between task difficulty and outcome, including baseline RSE as a covariate.

IV	DV	M	Indirect Effect	Bootstrap 95% CI
Difficulty	SCS	Belief in Heart	1.3235	[0.2792, 3.0484]
	RSE	Belief in Heart	.2252	[0.0334, 0.6006]
	DASS-42 Depression	Belief in Head	-.3010	[-0.7906, -0.0333]

Note: Based on 5000 bootstrap samples.

Table J4

Effects of belief in self-compassion components when controlling for baseline RSE.

Outcome	Belief Measure	β	t	Bootstrap 95% CI
ΔSCS	Self-kindness Head	-.331	-2.536	[-0.595, -0.012]
ΔRSE	Self-kindness Head	-.093	-3.566	[-0.160, -0.002]
ΔTOSCA-3 Detachment	Common Humanity Head	.099	2.609	[0.046, 0.207]

Note: Based on 5000 bootstrap samples.

APPENDIX K

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APPROVAL CERTIFICATE

December 20, 2013

TO: **Tara Conway** (Advisor E. Johnson)
Principal Investigator

FROM: **Jacquie Vorauer, Chair**
Psychology/Sociology Research Ethics Board (PSREB)

Re: **Protocol #P2013:095**
"Predicting efficacy of a self-compassion induction"

Please be advised that your above-referenced protocol has received human ethics approval by the **Psychology/Sociology Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement (2). It is the researcher's responsibility to comply with any copyright requirements. **This approval is valid for one year only**.

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

Please note:

- **If you have funds pending human ethics approval, please mail/e-mail/fax (261-0325) a copy of this Approval (identifying the related UM Project Number) to the Research Grants Officer in ORS in order to initiate fund setup. (How to find your UM Project Number: http://umanitoba.ca/research/ors/mrt-faq.html#pr0)**

- **if you have received multi-year funding for this research, responsibility lies with you to apply for and obtain Renewal Approval at the expiry of the initial one-year approval; otherwise the account will be locked.**

The Research Quality Management Office may request to review research documentation from this project to demonstrate compliance with this approved protocol and the University of Manitoba Ethics of Research Involving Humans.

The Research Ethics Board requests a final report for your study (available at: http://umanitoba.ca/research/orec/ethics/human_ethics_REB_forms_guidelines.html) **in order to be in compliance with Tri-Council Guidelines.**

APPENDIX L

Information and Consent Form

Study Name: *Predicting efficacy of a self-compassion induction*

Principal Investigator: *Tara Conway, M.A. Student, Clinical Psychology*

ConwayT@myumanitoba.ca

Research Supervisor: *Dr. Johnson, Associate Professor, Psychology*

(204) 474-9006/Ed_Johnson@umanitoba.ca

Sponsor: *None*

This consent form, a copy of which you may save or print for your records and reference at this time (it will not be available later), is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to contact us. Please take the time to read this carefully and to understand any accompanying information.

Tara Conway is conducting this study as her Master's Thesis, under the supervision of Dr. Johnson. The purpose of this study will be to examine a possible mechanism by which a writing task leads to an increase in self-compassion. Participants in this study will be asked to describe a time when they experienced shame, which may cause some distress. In the event that this distress becomes very upsetting, please use the contact information provided below for crisis support services. However, this experience of shame will be re-evaluated from a self-compassionate perspective, with the goal of decreasing distress and increasing overall well-being. Accordingly, we do not expect any distress experienced to last long. In addition, participants will be asked to complete several questionnaires that measure self-compassion, depressive symptoms, shame-proneness, rumination, self-esteem, and mood, and to provide demographic information such as age and sex.

This is an online study that has four parts, with the first three parts completed over the course of one week, and the fourth part completed two weeks later as a follow-up. The first part will take the longest to complete, as it includes all measures and tasks. We estimate that it should take between 30 and 45 minutes to complete. Parts two and three do not include the baseline measures, so should take no longer than 30 minutes to complete. Part four includes only the follow-up measures, so should also take no longer than 30 minutes to complete.

Participants will receive two research participation credits for completing the first part of the study, and one credit for each of the following parts. Students who participate in all four parts of

the study will therefore receive a total of five research participation credits. Students who do not participate in part one cannot participate in part two or any subsequent parts. Similarly, participant who do not participate in either part two or part three cannot participate in part four. Although we would appreciate your continued participation, you are not required to complete parts two, three or four of the study even if you participate in part one. A potential benefit of participating in all four parts of the study, other than receiving five participation credits, is that you might experience an increase in self-compassion, which has been associated with more positive reactions to negative life events (Leary et al., 2007).

Your participation in this study is completely voluntary. Should you choose to withdraw from the study at any point, you may do so without any penalty. This means that should you choose to withdraw at any point from the first part of the study you will still receive two research participation credits. Should you choose to withdraw at any point from the second part of the study, you will still receive one research participation credit, and similarly for parts three and four, for a total of five participation credits across the four parts of the study.

All of the answers you provide will be kept confidential, with the sole exception that there is a legal requirement to report suspected abuse of children or other vulnerable persons. If you provide information about the abuse of any individual, yourself included, under the age of 18 at the time of the abuse, then this information, along with identifying information (e.g. names) provided, must be reported to the police. Any information you provide will be stored on the encrypted and password protected site, Qualtrics, and on password-protected computers. Only the PI, her supervisor, and other authorized lab personnel (e.g., research assistants) will have access to your data. We need to keep your contact information (name and email) linked with the data until the end of the study, so that we can invite you to the second, third and fourth parts of the study and connect your responses across the four parts. We also need it to ensure that participants who are recruited in different ways (some are invited and others sign up online) do not inadvertently participate in the study twice. However, we will keep your identifying information confidential. Once the fourth part of the study is completed and we have had a chance to connect responses, we will delete all identifying information from our data, thus rendering it anonymous; we estimate we will do this by June 2014. Once all the data are collected and analyzed for this project, we plan to share this information with the research community through seminars, conferences, presentations, and journal articles. When presenting the results of this research, we will in no way focus on individual participants' responses and will instead present the findings in summary form.

The results of this study should be available by December 2014. If you would like to receive a summary, please follow the link at the end of the survey. This will redirect you to a site where you can provide your name and contact information, which will be kept completely separate from your survey responses. You only need to provide this information if you wish to receive a summary of the results; you are not required to provide this information to receive credit for your participation.

Clicking "I agree" at the bottom of this page indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers,

sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, without prejudice or consequence. If you wish to withdraw, simply close the browser window at any time. If you do choose to withdraw from this study, we will destroy any data that you have provided and not include it in the analysis. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification of new information throughout your participation.

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

This research has been approved by the Psychology/Sociology Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator at 474-7122.

If you have read the information presented in this form and do not have any questions about this study, please click "I agree" when you are ready to begin. You should only click "I agree" if you agree to participate with full knowledge of the study presented to you in this information and consent form and of your own free will. We suggest that you be in a quiet place, when you have up to 45 minutes free, and where you can complete this survey on your own and without interruption. We would appreciate it if you could turn off all instant messaging programs, as well as any other programs, currently running on your computer before continuing. Thank you for your consideration.

We strongly encourage you to save or print a copy of this consent form now for your records, as it will not be available later.

If you do not wish to participate in this study now, please close your web browser. You may return to participate at a later date and time (remember, you have 48 hours to complete this study from the date and time of your appointment). Thank you for considering participating.

Local Free Counseling Resources available to you:

University of Manitoba Student Counseling and Career Centre – (204) 474-8592

University of Manitoba Psychological Service Centre – (204) 474-9222

Klinic 24 Hour Crisis Line – (204) 786-8686.

Leary, M.R., et al., Self-compassion and reactions to unpleasant self-relevant events: the implications of treating oneself kindly. J Pers Soc Psychol, 2007. 92(5): p. 887-904.

APPENDIX M

Recruitment Scripts

Study Advertisement on Psychology Participation Pool Website

Predicting Efficacy of a Self-Compassion Induction

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Credit: This ***online*** study is worth 6 credits in total if you participate in parts 1, 2, 3 and 4. Students who participate in part 1 do not have to participate in parts 2, 3 or 4. Consent will be required for each part. Those who participate in part 1 will be invited to participate in part 2. Similarly, those who participate in part 2 will be invited to participate in part 3, and likewise for part 4.

Two (2) credits will be given for part 1 of the study, one (1) credit will be given for part 2, one (1) credit will be given for part 3, and one (1) credit will be given for part 4. In order to receive the five (5) credits possible for participation, students must participate in all four parts.

The purpose of this ***online*** study will be to examine a possible mechanism by which a writing task leads to an increase in self-compassion. ***The first three parts of the study will be completed online over the course of one week, and the fourth part will be completed online two weeks later. You will have a 48-hour window of time in which to complete each part of the study. You will be invited to participate in each part of the study by email, and this email will signal the beginning of the time window available for you to complete that part of the study.*** The first part will take the longest to complete, as it includes all measures and tasks. We estimate that it should take between 30 and 45 minutes to complete. Parts two and three do not include the baseline measures, so should take no longer than 30 minutes to complete. Part four includes only the follow-up measures, so should also take no longer than 30 minutes to complete.

If you choose to register for this study, you will receive an email from an on-line Survey company called Qualtrics welcoming you to the study and giving you the click-through link to the ***online*** survey.

Welcome message for Time 1 survey

Thank you for agreeing to participate in our study on Predicting Efficacy of a Self-Compassion Induction. You will receive two (2) credits for your participation in this part of the study. If you complete this part, you will be invited to participate in the next three parts. If you agree to participate in parts 2 and 3, you must complete them within a one-week period from the date you complete part 1. If you complete parts 2 and 3, you will be invited to participate in part 4, two weeks later. If you complete all four parts of the study you will receive a total of five (5) credits.

Thanks for your participation!

Email message that was sent from Qualtrics with link to survey for Time 2

Thank you for participating in part 1 of our study on Predicting Efficacy of a Self-Compassion Induction.

Because you participated in part 1, you have the opportunity to receive 3 (three) credits for participating in parts 2, 3 and 4. Each part should take no longer than 30 minutes to complete. Part 2 must be completed within the next 48 hours. If you complete part 2, you will be invited to participate in part 3 one day later. If you complete part 3, you will be invited to participate in the final part of the study two weeks later.

You have 48 hours in which to participate in this part of the survey.
Here is a link to the survey:
[SurveyLink]

This link is uniquely tied to this survey and your email address. Please do not forward this message.

When you click on the link, you will be taken to the consent and description page of the survey.

Sincerely,

Tara Conway, BA, BSc (Principal Investigator)
ConwayT@myumanitoba.ca

Thanks for your participation!

Email message that was sent from Qualtrics with link to survey for Time 3

Thank you for participating in parts 1 and 2 of our study on Predicting Efficacy of a Self-Compassion Induction.

Because you participated in part 2, you have the opportunity to receive 2 (two) credits for participating in parts 3 and 4. Each part should take no longer than 30 minutes to complete. Part 3 must be completed within the next 48 hours. If you complete part 3, you will be invited to participate in the final part of the study two weeks later.

You have 48 hours in which to participate in this part of the survey.
Here is a link to the survey:
[SurveyLink]

This link is uniquely tied to this survey and your email address. Please do not forward this message.

When you click on the link, you will be taken to the consent and description page of the survey.

Sincerely,

Tara Conway, BA, BSc (Principal Investigator)
ConwayT@myumanitoba.ca

Thanks for your participation!

Email message that was sent from Qualtrics with link to survey for Time 4

Thank you for participating in parts 1, 2 and 3 of our study on Predicting Efficacy of a Self-Compassion Induction.

Because you participated in part 3, you have the opportunity to receive 1 (one) final credit for participating in part 4 of the study. The final survey should take no longer than 30 minutes to complete.

You have 48 hours in which to participate in this part of the survey.
Here is a link to the survey:
[SurveyLink]

This link is uniquely tied to this survey and your email address. Please do not forward this message.

When you click on the link, you will be taken to the consent and description page of the survey.

Sincerely,

Tara Conway, BA, BSc (Principal Investigator)
ConwayT@myumanitoba.ca

Thanks for your participation!