Behaviour Research and Therapy 58 (2014) 43–51

Contents lists available at ScienceDirect

Behaviour Research and Therapy

journal homepage: www.elsevier.com/locate/brat

Self-compassion as an emotion regulation strategy in major depressive disorder

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ARTICLE INFO

Article history:
Received 14 October 2013
Received in revised form
4 May 2014
Accepted 7 May 2014
Available online 27 May 2014

Keywords:
Depression
Self-compassion
Cognitive reappraisal
Acceptance
Emotion regulation
Mood

ABSTRACT

Cognitive reappraisal and acceptance are two presumably adaptive emotion regulation strategies in depression. More recently, self-compassion has been discussed as another potentially effective strategy for coping with depression. In the present study, we compared the effectiveness of self-compassion with a waiting condition, reappraisal, and acceptance in a clinically depressed sample, and tested the hypothesis that the intensity of depressed mood would moderate the differential efficacy of these strategies. In an experimental design, we induced depressed mood at four points in time in 48 participants meeting criteria for major depressive disorder. After each mood induction, participants were instructed to wait, reappraise the situation, accept their negative emotions, or employ self-compassion to regulate their depressed mood. Self-ratings of depressed mood were assessed before and after each mood induction and regulation phase. Results showed that the reduction of depressed mood was significantly greater in the self-compassion condition than in the waiting condition. No significant differences were observed between the self-compassion and the reappraisal condition, and between the self-compassion and the acceptance condition in patients' mood ratings. However, the intensity of self-rated depressed mood at baseline was found to moderate the comparative effectiveness of self-compassion and reappraisal with a trend of self-compassion being more effective than reappraisal in high depressed mood at baseline. These findings support the use of self-compassion as another adaptive emotion regulation strategy for patients with major depressive disorder, especially for those suffering from high levels of depressed mood.

Major depressive disorder (MDD) is one of the most prevalent (Kessler et al., 2005) and debilitating (Üstün, Ayuso-Mateos, Chatterji, Mathers, & Murray, 2004) mental disorders. In the last two decades, various authors have explored the role of deficits in adaptive emotion regulation (ER) as a putative risk or maintaining factor of this frequently recurring (Judd, 1997; Kupfer, 1991; Solomon et al., 2000) or even chronic (Keller et al., 1992) disorder (e.g., Berking, Ebert, Cuijpers, & Hofmann, 2013; Hofmann, Sawyer, Fang, & Asnaani, 2012). Thompson (1994) defined ER as "extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (pp. 27–28). The term *adaptive* ER usually refers to the application of strategies that allow the individual to cope with undesired emotions in a way that does not interfere with the attainment of personally relevant goals and the satisfaction of basic-needs (Bridges, Denham, & Ganiban, 2004; Grawe, 2007).

With regard to the assumed influence of deficits in adaptive ER on the development and maintenance of depression, Berking and Whitley (2014) hypothesized that such cause aversive affective states to persist longer and with greater intensity than desired by the individual, and also lead to the individual experiencing a loss of control over their feelings and hence to the impression that these feelings will continue to impair their well being. According to Teasdale and Barnard (1993), the appraisal of a situation as highly *aversive*, *uncontrollable* and *stable over time* results in the activation

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http://dx.doi.org/10.1016/j.brat.2014.05.006
0005-7967/

of depressogenic information processing schema which cue further negative affective states. In the absence of adaptive ER skills, a vicious cycle of undesired affective states and depressogenic appraisals of these states may develop and contribute to the development and maintenance of MDD (Lara & Klein, 1999; Teasdale & Barnard, 1993, pp. 168–175 and 212–214). Teaching patients effective ER skills can be assumed to interfere with this vicious cycle and help patients overcome MDD. However, at this point it is unclear which ER strategies are most effective for this purpose.

Cognitive reappraisal is a core therapeutic technique in cognitive behavioral therapy (CBT) which is a well evidenced psychological treatment in MDD (Butler, Chapman, Forman, & Beck, 2006). In the past decade, the dominance of the cognitive-behavioral paradigm was challenged by the so called third-wave in CBT (Hayes, 2004) which focuses on enhancing the patients' ability to accept and tolerate negative (affective) states (Hayes, 2004). Recently, the use of self-compassion has been proposed as another potentially adaptive strategy when coping with negative emotions (Gilbert & Procter, 2006; Neff, 2003). In the following paragraphs we will present a brief overview on these strategies as well as the available evidence for their efficacy in the context of coping with depression.

Cognitive reappraisal was defined by Gross and John (2003) as (mentally) "construing a potentially emotion-eliciting situation in a way that changes its emotional impact" (p. 349). Given the evidence for the relevance of negatively biased information processing in depression (Gotlib & Joormann, 2010; Gotlib & Krasnoperova, 1998; Teasdale & Barnard, 1993), cognitive reappraisal is hypothesized to correct these biases and thus reduce negative affect and associated symptoms in depression (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Beck, 1967). Acceptance has been defined as the "openness to internal experiences and willingness to remain in contact with those experiences even if they are uncomfortable" (Campbell-Sills, Barlow, Brown, & Hofmann, 2006, p. 1253). Given (a) that depressogenic information processing involves appraising one's current situation as aversive (Teasdale & Barnard, 1993, p. 212–214), (b) that such an appraisal can be assumed to be based on the comparison between a perceived current state and a desired state (Miller, Galanter, & Pribram, 1960), and (c) that depressed individuals often engage in counterproductive strategies to get rid of undesired emotions and depressive symptoms (such as rumination or suppression, see Aldao et al., 2010; Ehring, Tuschen-Caffier, Schnülle, Fischer, & Gross, 2010; Joormann & Gotlib, 2010; Papageorgiou & Wells, 2004) it can be hypothesized that acceptance is an adaptive ER strategy for depression as it lowers the desired state and hence also the appraisal of the current situation as aversive (Berking & Whitley, 2014).

Numerous studies show that deficits in reappraisal and acceptance play an important role in the development and maintenance of depression and that effectively employing both strategies may help reducing depression. For example, correlational studies indicate that cognitive reappraisal and acceptance are associated with fewer negative emotions and symptoms of depression in healthy populations (e.g., Aldao & Nolen-Hoeksema, 2010; Garnefski & Kraaij, 2006; Garnefski, Kraaij, & Spinhoven, 2001; Garnefski, Teerds, Kraaij, Legerstee, & van den Kommer, 2004; Gross & John, 2003; Shallcross, Troy, Boland, & Mauss, 2010) and in clinically depressed individuals (Barnow, Arens, & Balkir, 2011). Moreover, depressed individuals have been found to use reappraisal to a smaller extent than healthy controls (D'Avanzato, Joormann, Siemer, & Gotlib, 2013; Kuyken & Brewin, 1994). In a longitudinal study it has been shown that deficits in the use of cognitive reappraisal and acceptance predict subsequent depressive symptom severity in healthy individuals (Kraaij, Pruymboom, & Garnefski, 2002). Experimental studies have demonstrated that never-depressed and recovered-depressed individuals employed experimentally induced reappraisal equally successful (Ehring et al., 2010) and that recovered depressed participants experienced greater reduction of negative mood when they adhered to the instructions of an acceptance exercise than did participants who did not (Singer & Dobson, 2008). In still another experimental study in patients diagnosed with either depression or an anxiety disorder, acceptance was shown to be more effective in reducing negative affect than suppression (Campbell-Sills et al., 2006).

Self-compassion has recently been discussed as another important strategy to cope with negative emotions and depression, and has been defined by Neff (2003) in terms of three (bipolar) components: (a) self-kindness (vs. self-judgment), which is the ability to treat oneself with care and understanding as opposed to being self-judgmental and self-critical; (b) common humanity (vs. isolation), which refers to the recognition that imperfection and failures are normal and shared aspects of human-beings, as opposed to feeling alone when failing and being imperfect; and (c) mindfulness (vs. overidentification), which involves being aware of and accepting experiences as opposed to overidentifying with thoughts and emotions. Since self-critical individuals lack self-kindness, self-compassion (including its subcomponent self-kindness) has been stated to be an especially helpful ER strategy in self-critical individuals (Gilbert & Procter, 2006). Given the role of self-criticism as a risk and maintaining factor in depression (Brewin & Firth-Cozens, 1997; Flett, Hewitt, & Mittelstaedt, 1991; Marshall, Zuroff, McBride, & Bagby, 2008; Murphy et al., 2002; Rector, Bagby, Segal, Joffe, & Levitt, 2000; Sturman & Mongrain, 2005; Zuroff, Igreja, & Mongrain, 1990), self-compassion can be assumed to reduce negative emotions and depression.

With regard to the efficacy of self-compassion, research has shown that self-compassion is cross-sectionally associated with more positive emotions, less negative emotions, and less severity in depressive symptoms in healthy and clinical samples (for an overview, see Hofmann, Grossman, & Hinton, 2011 or MacBeth & Gumley, 2012; Neff & McGeehee, 2010; Neff, Rude, & Kirkpatrick, 2007). Moreover, in a study conducted by Krieger, Altenstein, Baettig, Doerig, and Grosse-Holtforth (2013), individuals with MDD have been found to report less self-compassion when suffering from negative emotions than healthy controls. Difficulties in being self-reassuring were also found to lead to depressive symptoms in a student sample (Gilbert, Baldwin, Irons, Baccus, & Palmer, 2006) and practicing self-compassion resulted in subsequent increases in happiness and subsequent decreases in depression in individuals at risk for depression (Shapira & Mongrain, 2010). Additionally, Kuyken et al. (2010) found in remitted depressed individuals that an increase in self-compassion (and mindfulness) during mindfulness-based cognitive therapy predicted less severe depressive symptoms 15 months after remission.

Given that observational studies provide limited information on the direction of causal pathways, it is of note that recently findings were published providing preliminary evidence that self-compassion can be effectively used in the treatment of mental health problems such as depression. For example, compassionate self-support is one of the seven skills taught and practiced in the Affect Regulation Training (ART; Berking, 2007; Berking & Schwarz, 2013; Berking & Whitley, 2014) and includes (a) self-compassion, (b) self-soothing and self-encouragement, and (c) active self-coaching. In a recent study, it was shown in individuals suffering from MDD that integrating ART into traditional CBT was associated with a greater increase of self-support and a greater reduction of psychopathological symptoms when compared to CBT alone (Berking et al., 2013). However, since the training incorporates

seven skills, it is unclear to what extent the training of compassionate self-support was responsible for the training's effect on psychopathological symptoms. Moreover, in the absence of (longitudinal) mediation analyses it is unclear whether the potential effects of self-compassion training on self-compassion mediated the effects of the treatment on depression.

Treatments with a more exclusive focus on self-compassion include Compassion-Focused Therapy (CFT; Gilbert, 2010) and Mindful Self-Compassion program (MSC; Neff & Germer, 2013). Evidence for the efficacy of CFT in reducing depressive symptoms comes from some feasibility and pilot trials (Gilbert & Procter, 2006; Laithwaite et al., 2009; Lucre & Corten, 2013; Mayhew & Gilbert, 2008) and from a randomized controlled trial (Braehler et al., 2013). Evidence for the efficacy of MSC comes from a study indicating that in a community sample participating in MSC was associated with a greater reduction of depressive symptom severity than was participating in a waiting control condition; and the increase of self-compassion in the experimental condition was significantly associated with decreased levels of depression (Neff & Germer, 2013).

In sum, there is significant evidence for the positive effects of reappraisal, acceptance and self-compassion on depression. However, there is still a lack of studies comparing the efficacy of self-compassion with the efficacy of other empirically evidenced strategies in MDD in an experimental design. Moreover, several authors have pointed out that the efficacy of specific ER strategies depends on the context in which strategies are applied (e.g., Aldao, 2013; Aldao & Nolen-Hoeksema, 2012; Bonanno, Papa, Lalande, Westphal, & Coifman, 2004). For example, suppression might be an effective strategy for individuals who also have the ability to experience their emotions if necessary but might be counterproductive for individuals with strong fears and avoidance tendencies towards aversive affective states (Feldner, Zvolensky, Eifert, & Spira, 2003). Similarly, the intensity of mood states or emotions has been proposed as a potentially relevant moderator of the efficacy of specific ER strategies (Aldao, 2013). More specifically, it has been hypothesized by Berking and Whitley (2014) that cognitive reappraisal and acceptance may become more difficult to utilize as a person's suffering intensifies, since increasingly higher levels of negative affect tend to cue more negative thoughts (Bower, 1981; Sheppes & Meiran, 2007) and to increase the discrepancy between the perceived present state and the individual's need for well-being (Grawe, 2007, p. 165–348). Contrastingly, self-compassion may become *easier* to utilize as a person's suffering increases, since the intensity of the observed suffering is an important antecedent for the elicitation of compassion (Hein & Singer, 2008). Preliminary empirical support for this hypothesis comes from a study indicating that reappraisal is less effective when initiated late in an emotion generation process which was attributed by the authors to the greater intensity of the emotion at the end of the generation process (Sheppes & Meiran, 2007). However, at this point it has not yet been investigated whether the intensity of depressed mood moderates the comparative efficacy of self-compassion, cognitive reappraisal, and acceptance in a clinically depressed sample.

Thus, the objective of the present study was to compare the efficacy of self-compassion on depressed mood in individuals with MDD with the efficacy of cognitive reappraisal and acceptance (and a waiting condition to control for time effects), and to clarify whether the differential effects of the active strategies would be moderated by the intensity of initial depressed mood. More specifically, we tested the hypothesis that self-compassion would be inferior to cognitive reappraisal and acceptance when MDD individuals have to cope with low levels of depressed mood, whereas self-compassion would be superior to cognitive reappraisal and acceptance when MDD individuals have to cope with high levels of depressed mood.

Method

Participants

The study sample consisted of 48 clinically depressed participants. Inclusion criteria were a current clinical diagnosis of MDD, age 18 and above, and proficiency in the German language. The exclusion criteria included high risk of suicide, indication of substantial secondary gain of having the mental illness (e.g., getting early retirement pensions because of mental health problems), organic brain disorders, severe medical conditions and severe cognitive impairment. To enhance the external validity of the study, we included patients with comorbid diagnoses. However, we excluded patients with severe mental disorders that would significantly interfere with the experiment (namely acute substance abuse or dependence, psychotic disorder, or bipolar disorder). The majority of participants were female (62.5%). The average age of the participants was 35.7 years ($SD = 12.1$, range = 18–63). Most participants (66.7%) met criteria for at least one other disorder, including dysthymic disorder (14.6%), panic disorder with or without agoraphobia (12.5%), social anxiety disorder (14.6%), generalized anxiety disorder (6.3%), obsessive-compulsive disorder (6.3%), posttraumatic stress disorder (6.3%), eating disorders (8.3%), somatoform disorders (2.1%), sexual disorders and dysfunctions (2.1%), as well as personality disorders (12.5%).

Procedures

Sample selection

Undergraduate assistants contacted participants who had previously applied for treatment of depressive symptoms at the outpatient department of the University of Mainz by telephone. In these pre-screening interviews, participants were provided with an overview of study procedures and were screened for meeting study criteria. Potentially eligible participants were then invited to an intake interview with a certified clinical psychologist who verified participants' eligibility for the study, assessed diagnostic status of MDD, possible comorbid disorders, and suicide risk. Suicide risk was assessed by exploring participants' thoughts, plans and intents to commit suicide. Suicidal participants (expressing concrete suicide plans or intentions) were excluded from the study and referred to proper care. After the intake interview, study therapists conducted a detailed assessment of the presenting problems and history, personal, psychosocial, psychiatric, medical history, and diagnostic status using the Structured Clinical Interview for DSM–IV Axis I and II Disorders (SCID; German version: Wittchen, Zaudig, & Fydrich, 1997). Therapists conducting the intake interviews and study therapists were all trained in conducting SCIDs. All diagnostic assessments of study therapists were thoroughly discussed with an experienced supervisor (as these therapists were therapists in advanced but not yet completed clinical training). The concordance of the MDD-diagnoses made by the certified clinical psychologists at intake and the study therapists showed a concordance rate of 81% and a Cohen's Kappa of 0.67. After the assessment and before the start of the cognitive-behavioral treatment, consenting participants took part in the experiment.

Experimental session

The experiment was administered on a Dell Optiplex 740 MT computer using Presentation software (Neurobehavioral Systems, Albany, CA). The entire procedure took approximately 60 min. At the beginning, participants were asked to rate their mood (baseline

rating) by responding to the question "How depressed are you feeling at the moment?" on an individual computer-based visual analog scale (VAS) composed of a vertical line anchored on one end by the words *not at all* (= 0) and on the other end by the word *completely* (=100). Subjects were asked to place a mark on the line at the point that best described their answer. Next, depressed mood was induced by low mood inducing music (*Adagio in G minor* by Tomaso Giovanni Albinoni played with 50% of the original velocity) in combination with a modified Velten mood induction procedure (Velten, 1968). As part of the latter, participants were instructed to read a series of ten statements presented on the computer screen (one statement per page) and to focus on the resulting emotions. The statements had a depressing content (e.g., *I think I am a loser*). The low-mood inducing music was played as background music. Participants were asked to adjust the volume to their preferred sound level. They were then given the following instruction: "Try to experience the mood caused by the statements." The effectiveness of the Velten procedure (Gerrards-Hesse, Spies, & Hesse, 1994; Westermann, Spies, Stahl, & Hesse, 1996), of mood-suggestive music (Westermann et al., 1996), and of the combination of both methods has been demonstrated in previous studies (Westermann et al., 1996). After the mood induction, participants were asked to rate their mood on the VAS again (post-induction rating = pre-strategy rating if another strategy followed). Next, the following instructions for ER strategies were presented on the screen: "Through the speaker you will be taught a strategy to regulate your mood. You are free to close your eyes in the meantime. Please click to go on." By pressing the mouse button, participants initiated audio instructions on one of the three ER strategies investigated in the experiment. The instructions for cognitive reappraisal were developed by the authors with the purpose of representing strategies typically taught in cognitive therapy (e.g., Beck, 2011). The instructions for acceptance and self-compassion were abbreviated versions of audio sequences used in the ART to train these skills (Berking, 2010; Berking & Whitley, 2014).

The cognitive reappraisal instructions were as follows: "Please read the statements closely again. Choose one statement you can identify yourself with and which influences your mood in a particularly negative way, and click on it. Read it over again and take your time reflecting on it. What are the consequences of thinking this way? How do you feel if you think like that? Does this thought help you feel how you want to? And how does it influence your behavior if you think like that? Does this thought help you behave like you want? Then please think about which arguments would validate this statement and whether you have made experiences in the past that are consistent with these statements. Then, consider carefully whether there are also arguments against this statement. Maybe you can also identify experiences you have made in the past that are inconsistent with this statement. Based on this reflection, try to reformulate the statement in a more positive and helpful way. Feel free to try different versions until you have found one that really makes you feel better. If you want, say this new, positive statement a few times aloud, until you notice that you are getting into a better mood."

The acceptance instructions were as follows: "Please focus your attention on what you are feeling at the present moment. Try to label the perceived feelings and to simply rate their intensity on a scale from 0 to 10. Observe these feelings for a while. Try to let them be without controlling them. If you notice that you digress or that other thoughts come to mind, just make a mental note of your thoughts or your digression, and then focus on your feelings again. Give yourself the permission to experience these feelings, even if they are unpleasant. Now try to set the acceptance of your feelings as a goal. Try to underpin this with a statement, e.g. 'Now it is important to accept my feelings and to give myself permission to feel them because down-regulating emotions may take some time.' Then continue with the exercise by activating a positive attitude towards your feeling by completing the sentence 'This feeling also has a positive side: it wants to tell me that … ' to yourself. Now make yourself aware that you can also stand problematic feelings: Make yourself aware that you have already endured negative feelings over a longer period of time in the past. Consider that feelings are transient phenomena, and that feelings will not last forever. Feelings come and go; unpleasant feelings will not last forever."

The self-compassion instructions were as follows: "Try to experience very clearly which feelings have been activated by these statements. Try to see yourself from an outsider's point of view, from the perspective of a compassionate, friendly observer, to actually visualize in your mind how you look, sitting here in front of the computer. Maybe you can notice from the outside which feeling upsets you at the moment. Try to perceive now how the negative feelings are reflected in your posture and facial expression. Then, try to let the warm and strong feeling of compassion towards yourself arise within yourself; this warm and strong feeling of compassion, that goes along with the desire to help yourself. If you sense this feeling, you can start approaching yourself in your imagination, enter the visualized scene and tell yourself that you are there to help. Maybe you can say to yourself: 'It is understandable that you feel that way. You are facing a challenging situation. You experience a natural response to depressing thoughts. But I am with you. I am going to help you. You are not alone.' In the next step you can start encouraging yourself internally: 'Come on, you can do this. You can pull yourself out of this mood again. You have already accomplished so much; you will also be able to deal with this.' If you want, you can also visualize putting your hand on your shoulder or hugging yourself to sooth and comfort yourself. Then, try to cheer yourself up by internally giving yourself a friendly smile. While smiling in a friendly manner at yourself, you can check if there are other things you want to tell yourself; things that would energize and encourage you to cheer yourself up. Take your time to think of some sentences and tell them to yourself. At the proper moment, you can start saying good bye to yourself. Remind yourself that this will not be a farewell forever but that you can come back to yourself every time you want. Perhaps there is still something you want to tell yourself for farewell. If so, do this now before you come back from this exercise to the here and now, slowly, in your own way."

The instructions for the waiting condition were displayed on the computer screen: "There will now be a break of about 5 min. Please just remain seated calmly during this time. The program will signal the end of the break to you." After receiving one of these instructions, participants were asked to rate their depressed mood on the VAS again (post-strategy rating = pre-induction rating if another mood induction followed).

The sequence of mood assessment, mood induction, mood assessment, and ER (or waiting condition) was repeated four times for each subject. To control sequence effects, we utilized all possible permutations of regulation sequences across the participants ($Ns = 24$). We included 48 participants to ensure sufficient power to detect moderate effects. We only included subjects with ratings of at least 10 (out of 100) on the depressed mood VAS in each of the four pre-strategy ratings of each subject to ensure that participants had a notable depressed mood that they could work to regulate.

Post-experiment assessment

After the experiment, subjects completed a short post-survey. They were asked what they had been doing in the waiting condition in an open question format. In addition, they rated to what extent they experienced specific difficulties when trying to follow

the regulation instructions. All these ratings were introduced by the question "Which aspects of the strategy were difficult for you to apply?". The answers were to be rated on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*completely*). Potential difficulties during the use of reappraisal included (1) to find arguments and situations that validate the statement, (2) to find arguments and situations that question the validity of the statement, and (3) to formulate a more positive statement. Potential difficulties during the use of acceptance to be rated included (1) to label the perceived feelings, (2) to rate their intensity, (3) to accept them, and (4) to activate a positive attitude towards them. Potential difficulties during the use of self-compassion included (1) to see oneself from an outsider's point of view, (2) to perceive how the own feelings were reflected in one's posture and facial expression, (3) to sense a feeling of compassion towards oneself and to support oneself, and (4) to encourage and cheer oneself up.

Following the post-survey, participants received a debriefing in which they were asked how they were currently feeling. If participants had reported severe depressed mood or suicidal tendencies during the debriefing, they would have received a crisis intervention by an experienced clinical psychologist. However, no such adverse events occurred. Moreover, participants were asked how they had experienced the application of the ER strategies. In response to this question, none of the participants reported that he or she had not at least attempted to apply the strategies as instructed. Written informed consent was obtained from all participants prior to the experimental session. All procedures were approved by the ethics committee of the Universities of Mainz and Marburg. The trial was registered with Clinicaltrials.gov, number NCT01330485.

Results

We used SPSS 19 for all analyses and set α at $p < .05$. Effect sizes for analyses of variance (ANOVAs) and analyses of covariance (ANCOVAs) are reported as partial eta-squared for which values of 0.01, 0.06, and 0.14 are considered to reflect small, medium, and large effects, respectively (Cohen, 1988). Cohen's *d* is presented for *t*-tests (small effect = 0.20, medium effect = 0.50, large effect = 0.80; Cohen, 1988).

Preliminary analyses

We used paired-sample *t*-tests to check the effectiveness of the four depressed mood inductions prior to the instructions of the four conditions. During the induction, average depressed mood increased from 55.04 ($SD = 26.01$) to 65.08 ($SD = 25.53$) prior to self-compassion ($t(1,47) = 3.51$, $p = .001$, Cohen's $d = 0.39$, small-to-medium effect), from 54.31 ($SD = 27.57$) to 64.40 ($SD = 23.96$) prior to cognitive reappraisal ($t(1,47) = 3.25$, $p = .002$, Cohen's $d = 0.39$, small-to-medium effect), from 54.77 ($SD = 25.23$) to 64.77 ($SD = 24.86$) prior to acceptance ($t(1,47) = 3.79$, $p < .001$, Cohen's $d = 0.40$, small-to-medium effect) and from 50.96 ($SD = 28.92$) to 63.71 ($SD = 25.06$) prior to the waiting condition ($t(1,47) = 4.17$, $p < .001$, Cohen's $d = 0.48$, medium effect). In addition, a repeated-measures ANOVA with the mood induction change scores as the dependent variable revealed no significant differences in the mood inductions of the four conditions, $F(1,47) = 0.33$, $p = .81$, partial $\eta^2 = 0.02$ (small effect).

To evaluate to what extent we had been able to control potential order effects by systematically employing all possible sequence permutations, we conducted four univariate ANOVAs (one for each strategy) with position as the fixed factor (first, second, third, fourth), post-strategy rating as the dependent variable and pre-strategy rating as the covariate. Results showed that post-strategy ratings for self-compassion, cognitive reappraisal, acceptance, and waiting did not differ as a function of their position within the experiment (all *F* values were non-significant). Thus, we did not control for order effects in subsequent analyses.

Finally, we analyzed whether the effectiveness of the strategies would be moderated by the existence or absence of comorbid diagnoses. A 4 × 2 × 2 repeated measures omnibus ANOVA with the within subject factors Strategy (self-compassion, waiting condition, cognitive reappraisal, acceptance) and Time (pre-strategy rating, post-strategy rating) and the between subject factor Comorbidities (yes, no) revealed no significant Time × Strategy × Comorbidities interaction, $F(1,47) = 1.46$, $p = .24$, partial $\eta^2 = 0.09$ (medium-to-large effect). Thus, we did not control for the presence of comorbid diagnoses.

Effectiveness of self-compassion in comparison to waiting, cognitive reappraisal and acceptance

A 4 (Strategy: self-compassion, waiting condition, cognitive reappraisal, acceptance) × 2 (Time: pre-strategy rating, post-strategy rating) repeated measures omnibus ANOVA to evaluate general effects of ER strategies revealed a significant effect of Time, $F(1,47) = 23.99$, $p < .001$, partial $\eta^2 = 0.33$ (large effect), and a significant interaction effect of Strategy × Time, $F(3,45) = 3.05$, $p = .04$, partial $\eta^2 = 0.13$ (large effect). The specific comparison between self-compassion and waiting identified significant effects of Time, $F(1,47) = 23.28$, $p < .001$, partial $\eta^2 = 0.33$ (large effect), and Strategy × Time, $F(1,47) = 7.22$, $p = .01$, partial $\eta^2 = 0.13$ (large effect). When comparing self-compassion with cognitive reappraisal, the Time effect was significant, $F(1,47) = 25.02$, $p < .001$, partial $\eta^2 = 0.35$ (large effect), whereas the Strategy × Time interaction was not, $F(1,47) = 0.03$, $p = .87$, partial $\eta^2 = 0.001$. When comparing self-compassion and acceptance the Time effect was also significant, $F(1,47) = 19.45$, $p < .001$, partial $\eta^2 = 0.29$ (small-to-medium effect), whereas the interaction of Strategy × Time was not, $F(1,47) = 1.60$, $p = .21$, partial $\eta^2 = 0.03$ (small-to-medium effect). However, it is of note that self-compassion and cognitive reappraisal demonstrated medium sized effects, acceptance a small-to-medium sized effect, and waiting a small effect (see Table 1).

Influence of depressed mood at baseline on efficacy of regulation strategies

To test the hypothesis that the differential efficacy of self-compassion, cognitive reappraisal and acceptance would be moderated by depressed mood at the beginning of the experiment, we used median split to create groups of low (scores: 10–53) and high (scores: 53–94) depressed mood at baseline. As illustrated in Fig. 1, participants experiencing lower levels of depressed mood displayed a greater reduction of depressed mood in the cognitive

Table 1
Mean depressed mood ratings, standard deviations and effect sizes.

	Depressed mood ratings				*d*
	Pre		Post		
	M	*SD*	*M*	*SD*	
Self-Compassion	65.08	25.53	53.44	26.87	0.45
Waiting Condition	63.71	25.06	57.88	26.31	0.23
Cognitive Reappraisal	64.40	23.96	53.21	27.04	0.44
Acceptance	64.77	24.86	56.31	27.02	0.33

Note: Mood ratings pre and post self-compassion, waiting, cognitive reappraisal and acceptance; *M* = Mean; *SD* = Standard Deviation; *d* = Cohen's *d*; small effect = 0.20; medium effect = 0.50; large effect = 0.80.

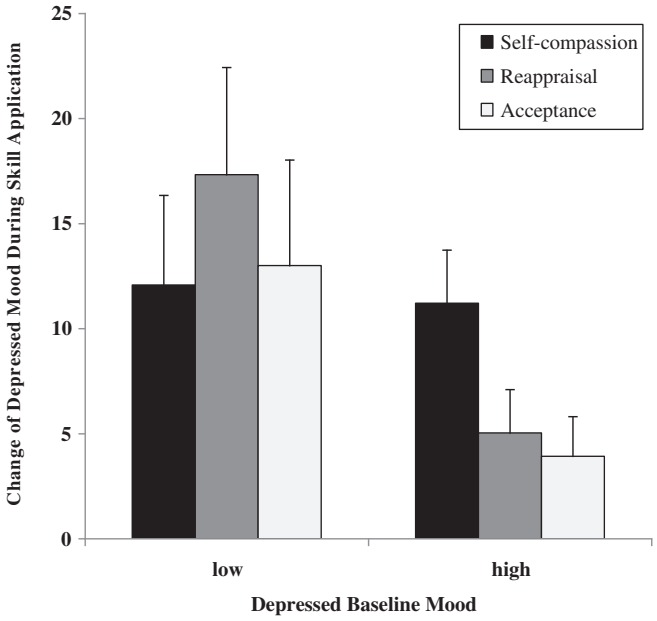

Fig. 1. Means and standard errors of changes in depressed mood during skill application for self-compassion, cognitive reappraisal and acceptance in patients with low and high depressed baseline mood.

reappraisal and acceptance conditions than in the self-compassion condition. In contrast, individuals with higher levels of depressed mood displayed a greater reduction of depressed mood in the self-compassion condition than in the cognitive reappraisal and in the acceptance condition. The two 2 × 2 repeated measures ANOVAs with the within-subjects factors Depressed Baseline Mood (low, high) and Changes of Depressed Mood during Strategy Application (change during self-compassion, change during cognitive reappraisal/acceptance) revealed a significant interaction effect for the comparison between self-compassion and cognitive reappraisal, $F(1,47) = 4.57$, $p = .04$, partial $\eta^2 = 0.09$ (medium-to-large effect). For the comparison between self-compassion and acceptance, the analyses revealed a non-significant trend, $F(1,47) = 2.76$, $p = .10$, partial $\eta^2 = 0.06$ (medium effect), for a potential moderating effect of mood at the beginning of the experiment.

To clarify which of the strategies was more effective in which group when comparing self-compassion and reappraisal, we conducted post-hoc repeated-measures ANOVAs (Changes of Depressed Mood during Strategy Application [change during self-compassion, change during cognitive reappraisal]) in each (low vs. high) depressed mood group. The post-hoc repeated-measures ANOVA in the low depressed mood group showed no significant difference between self-compassion and cognitive reappraisal, $F(1,23) = 1.43$, $p = .24$, partial $\eta^2 = 0.06$ (medium effect), and the post-hoc repeated measures ANOVA in the high depressed baseline group revealed a trend for a difference between self-compassion and reappraisal that missed the cut-off for statistical significance by a tiny margin, $F(1,23) = 4.11$, $p = .05$, partial $\eta^2 = 0.15$ (large effect).

Additional analyses

As further exploratory analyses, we computed means and standard deviations for the participants' reports on difficulties in applying self-compassion, cognitive reappraisal and acceptance (see Table 2) in post-hoc analyses. Additionally, we used a repeated measures ANOVA with the within-subjects-factor Difficulties in Strategy Application (mean difficulties in self-compassion, mean difficulties in cognitive reappraisal, mean difficulties in acceptance) to test whether the participants' difficulties in following the instructions differed significantly across strategies. Results revealed no significant difference between strategies, $F(2,37) = 2.60$, $p = .09$, partial $\eta^2 = 0.12$ (large effect).

Table 2
Mean ratings and standard deviations for difficulties in application of ER strategies.

ER strategies and its aspects	*M*	*SD*
Cognitive reappraisal	3.08	0.91
To find arguments and situations that validate statement	2.54	1.25
To find arguments and situations that question validity of statement	3.24	1.14
To formulate a more positive statement	3.45	1.21
Acceptance	3.42	0.77
To label perceived feelings	3.02	1.37
To rate intensity of feelings	3.43	1.36
To accept feelings	3.45	1.01
To activate a positive attitude towards feelings	3.86	1.06
Self-compassion	3.00	1.13
To see oneself from outsider's view	3.00	1.52
To perceive how feelings were reflected in posture and facial expression	2.95	1.31
To sense feeling of compassion towards oneself and to support oneself	3.23	1.56
To encourage and cheer oneself up	3.09	1.53

Note: Mean ratings and standard deviations for difficulties in applying (different aspects of) emotion regulation strategies; *M* = Mean; *SD* = Standard Deviation; *ER* = Emotion Regulation.

Discussion

The aim of this study was to compare the efficacy of self-compassion, waiting, cognitive reappraisal and acceptance with regard to down-regulating depressed mood in individuals meeting criteria for major depressive disorder (MDD), and to clarify whether the comparative efficacy of the active strategies would be moderated by the level of depressed mood as assessed at the beginning of the experiment. More specifically, we tested the hypothesis that self-compassion would be less effective than reappraisal and acceptance in patients with low depressed mood but more effective than reappraisal and acceptance in patients with high depressed mood. Results indicated that on average self-compassion was more effective than waiting, but was equally effective as cognitive reappraisal and acceptance with regard to down-regulating depressed mood (albeit effect sizes even indicate a slighter superiority of self-compassion and reappraisal over acceptance). However, a significant interaction effect between strategy and initial level of depressed mood indicated that the efficacy of self-compassion, when compared with reappraisal, was moderated by the intensity of initial depressed mood, with a nonsignificant superiority of reappraisal over self-compassion in lower depressed mood states and a non-significant superiority of self-compassion over reappraisal in higher depressed states. A similar but smaller effect was found for the effect of mood at baseline on the difference between self-compassion and acceptance but failed to reach the level of statistical significance.

The finding that self-compassion was superior to the waiting condition is consistent with prior results showing that the habitual use of self-compassion is associated with fewer negative and more positive emotions as well as less depression (MacBeth & Gumley, 2012; Neff & McGeehee, 2010; Neff et al., 2007) and that practicing the ability to be self-compassionate results in a decrease of depressive symptoms in individuals at risk for depression (Shapira & Mongrain, 2010). Our findings advance the literature, because they provide the first experimentally-based evidence for the efficacy of the instructed use of self-compassion (as opposed to

habitual use of self-compassion) in reducing depressed mood in individuals meeting criteria for MDD. The finding that the efficacy of the instructed use of self-compassion (as opposed to the habitual use) did not differ significantly from the efficacy of neither cognitive reappraisal nor acceptance is consistent with previous research providing evidence for the efficacy of all three strategies (e.g., Aldao & Nolen-Hoeksema, 2010; Campbell-Sills et al., 2006; Ehring et al., 2010; Garnefski & Kraaij, 2006; Garnefski et al., 2001, 2004; Gilbert et al., 2006; Gross & John, 2003; MacBeth & Gumley, 2012; Shallcross et al., 2010; Shapira & Mongrain, 2010; Singer & Dobson, 2008). The findings extend previous research as we directly compared the efficacy of self-compassion with other active and already established ER strategies.

The results of the present study have significant theoretical implications as they suggest that contextual factors affect the comparative efficacy of specific ER strategies (Aldao, 2013; Aldao & Nolen-Hoeksema, 2012; Bonanno et al., 2004; Feldner et al., 2003; Sheppes & Meiran, 2007). More specifically, they imply that in more severely depressed states depressed individuals benefit better from self-compassion than from cognitive reappraisal (and potentially acceptance) – possibly because more intense negative affective states are more difficult to be changed with the help of reappraisal (as they interfere more strongly with activating and utilizing positive thoughts) (or acceptance, as they are more difficult to accept) than with the help of self-compassion (the use of which might even be facilitated by offering an object for compassion that suffers more strongly; Berking & Whitley, 2014; Hein & Singer, 2008; Sheppes & Meiran, 2007; Sheppes, Scheibe, Suri, & Gross, 2011). If these findings receive further support in future research they have important clinical implications as they suggest that shifting the focus completely from strategies such as reappraisal or acceptance to self-compassion might not improve the efficacy of treatments for depression on average. However, teaching patients different skills as well as the ability to apply those skills that have been shown to be most effective under a given set of circumstances might indeed improve current treatments for depression.

Major limitations of the present study include the focus on only three ER strategies, the exclusive assessment of short-term effects during an experimental paradigm, and a sample size that provided merely moderate statistical power. With regard to the choice of strategies, future research should also include distraction or positive activities, strategies that have been shown to be effective for coping with depressed mood (e.g., Cuijpers, van Straten, & Warmerdam, 2007; Lam, Shuck, Smith, Farmer & Checkley, 2003; Nolen-Hoeksema & Morrow, 1993) and that can be hypothesized to be easier to use during intense depressed mood than cognitive appraisal (Sheppes & Meiran, 2007; Sheppes, Scheibe, et al., 2011). The exclusive assessment of short-term effects should also be considered as a limitation because some effective ER strategies may take more time to take effect but then might result in particularly large effects. Thus, future research should systematically assess both short- and long-term effects of ER strategies, ideally in participants' natural environment. Future research should also try to replicate the present study with larger sample sizes. This is particularly important for clarifying whether the non-significant trend for mood intensity moderating the difference between self-compassion and acceptance resulted from a lack of power or from a chance deviation from the true score. The use of a larger sample size in future studies would also allow to identify factors that moderate the moderating effect of mood on the efficacy of specific strategies. For example, the superiority of self-compassion over cognitive reappraisal might depend on the habitual use of self-compassion and reappraisal or on the anticipated ability to successfully utilize these skills.

It also needs to be acknowledged that the instructions used in the present study are unlikely to exclusively tap the intended ER strategy. For example, reframing the functions or consequences of emotions (e.g., thinking about what is good about an emotion) in the acceptance instructions involves both cognitive restructuring and acceptance. Similarly, instructing participants to visualize how to support themselves through self-soothing and self-encouragement can also be conceptualized as "construing a potentially emotion-eliciting situation in a way that changes its emotional impact" (Gross & John, 2003, p. 349), i.e. cognitive reappraisal. This overlap in the instructions is difficult to avoid since ER strategies partly overlap conceptually (Wolgast, Lundh, & Viborg, 2013). However, in spite of the partial conceptual and operational overlap, the concepts and instructions clearly differ in focus and hence provide information that is relevant for the question which strategy is most effective and which factors moderate the differential efficacy of these strategies. Nevertheless, future studies should systematically vary the instructions used to induce the indented ER strategies and clarify to what extent differences in these instructions affect the efficacy of these interventions.

Finally, it is of note that we investigated the efficacy of ER strategies in individuals who had previously not been systematically trained in the application of any of the strategies under investigation in the present study. However, difficulties that might initially be experienced by untrained patients when trying to apply unfamiliar strategies might be overcome through a systematic training in these strategies. Consistent with this hypothesis, Ng and Diener (2009, 2013) found that individuals scoring high on measures for neuroticism initially experienced difficulties in effectively utilizing reappraisal but were able to use this strategy effectively after a systematic training. Thus, future research should clarify how the differential efficacy of the ER strategies investigated in the present study is moderated by whether or not participants had received an intense training in these strategies.

Acknowledgements

This research was supported by the German Research Foundation Grant BE 4510/3–1/HI 456/6–1 awarded to Matthias Berking, Winfried Rief, and Wolfgang Hiller and Grant BE 4510/3–2/HI 456/6–2 awarded to Matthias Berking, Winfried Rief, Wolfgang Hiller, and Clemens Kirschbaum. Stefan Hofmann is supported by NIH/NCCAM grant R01AT007257. Additionally, the project was supported by research funds from the University of Mainz and the University of Marburg. We thank Sheina Godovich for thoroughly proofreading the manuscript.

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