Self-compassion enhances the efficacy of explicit cognitive reappraisal as an emotion regulation strategy in individuals with major depressive disorder

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ABSTRACT

Cognitive reappraisal has been shown to be an effective strategy to regulate depressed mood in healthy and remitted depressed individuals. However, individuals currently suffering from a clinical depression often experience difficulties in utilizing this strategy. Therefore, the goal of this study was to examine whether the efficacy of explicit cognitive reappraisal in major depressive disorder can be enhanced through the use of self-compassion and emotion-focused acceptance as preparatory strategies. Thereby, explicit cognitive reappraisal refers to purposefully identifying, challenging, and modifying depressiogenic cognitions to reduce depressed mood. To test our hypotheses, we induced depressed mood at four points in time in 54 participants (64.8% female; age $M = 35.59$, $SD = 11.49$ years) meeting criteria for major depressive disorder. After each mood induction, participants were instructed to either wait, or employ self-compassion, acceptance, or reappraisal to regulate their depressed mood. Depressed mood was assessed before and after each mood induction and regulation period on a visual analog scale. Results indicated that participants who had utilized self-compassion as a preparatory strategy experienced a significantly greater reduction of depressed mood during reappraisal than did those who had been instructed to wait prior to reappraisal. Participants who had used acceptance as a preparatory strategy did not experience a significantly greater reduction of depressed mood during subsequent reappraisal than those in the waiting condition. These findings provide preliminary evidence that the efficacy of explicit cognitive reappraisal is moderated by the precursory use of other emotion regulation strategies. In particular, they suggest that depressed individuals might benefit from using self-compassion to facilitate the subsequent use of explicit cognitive reappraisal.

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With a life-time prevalence of 16.6%, major depressive disorder (MDD) constitutes an important health problem (Kessler et al., 2005) that is associated with significant morbidity, mortality, disability, and emotional anguish for patients and their families (Murray & Lopez, 1997). Unfortunately, many patients fail to respond to empirically-based treatments (e.g., DeRubeis et al., 2005; Rush et al., 2006), and even those who do respond, remain impaired due to residual symptoms (Judd et al., 1998; Judd, Akiskal, & Paulus, 1997) or relapse (e.g., Thase et al., 1992; Vittengl, Clark, Dunn, & Jarrett, 2007). Given that deficits in emotion regulation (ER) have lately been discussed as a potentially maintaining factor in depression (Berking, Ebert, Cuijpers, & Hofmann, 2013; Hofmann, Sawyer, Fang, & Asnaani, 2012; Mennin, Holaway, Fresco, Moore, & Heimberg, 2007), the efficacy of current treatments for MDD might be improved by focusing more strongly on teaching patients adaptive ER skills which in turn might facilitate recovery from depression (Mennin & Fresco, 2009).

Adaptive ER refers to a goal-directed and flexible application of ER skills with regard to environmental demands (Aldao, Sheppes, &

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Gross, 2015; Gross, 2014; Sheppes et al., 2014). Consistent with this perspective on ER, the Adaptive Coping with Emotions (ACE) model (Berking & Whitley, 2014) conceptualizes adaptive ER as a situation-dependent interaction between the following ER skills: (1) the ability to be consciously aware of emotions, (2) the ability to identify emotions, (3) the ability to correctly label emotions, (4) the ability to identify what has caused and what maintains one's present emotions, (5) the ability to actively modify emotions, (6) the ability to accept and (7) tolerate undesired emotions when they cannot be changed, (8) the ability to approach situations that are likely to trigger negative emotions if necessary to attain personally relevant goals, and (9) the ability to provide compassionate self-support when working to cope with challenging emotions. The ACE model postulates that when it comes to the *reduction* of mental health problems, the ability to modify undesired emotions is most important among these skills (Berking & Whitley, 2014).

One of the most widely studied ER skills aiming at modifying negative emotions is cognitive reappraisal (CR; e.g., Gross, 2002; Gross & John, 2003; McRae, Jacobs, Ray, John, & Gross, 2012). CR has been defined as cognitively "construing a potentially emotion-eliciting situation in a way that changes its emotional impact" (Gross & John, 2003, p. 349). According to cognitive theories of depression, dysfunctional cognitive processes play an important role in the development and maintenance of depression (Beck & Haigh, 2014; Teasdale & Barnard, 1993; for critical reviews, see; Coyne & Gotlib, 1983 or; Haaga, Dyck, & Ernst, 1991). Hence, replacing depressogenic automatic appraisals with alternative evaluations of the situation (i.e., CR) can be assumed to have the potential to reduce negative emotions and associated symptoms in depression (Gotlib & Joormann, 2010). Several forms of CR exist (McRae, Ciesielski, & Gross, 2012). An explicit form of CR that is - among other cognitive strategies - often used in traditional cognitive (behavioral) therapy for depression consists of: (a) becoming aware of the thoughts cueing undesired affective states, (b) reflecting upon/testing the validity/consequences of these thoughts, (c) purposefully developing more valid/helpful thoughts, and (d) using these thoughts to modify one's feelings (e.g., Beck, 2011). This form of CR is not equal to the more complex process of cognitive restructuring, but may contribute to the restructuring of dysfunctional beliefs and thus the reduction of depression in the long-term. Empirical support for the anti-depressive effects of CR comes from studies indicating that CR is negatively associated with depression in non-clinical samples, both concurrently (see e.g. Aldao & Nolen-Hoeksema, 2010; Aldao, Nolen-Hoeksema, & Schweizer, 2010; Garnefski & Kraaij, 2006; Garnefski, Boon, & Kraaij, 2003) and prospectively (e.g., Kraaij, Pruymboom, & Garnefski, 2002). Further evidence originates from studies demonstrating that experimentally induced CR helps healthy and recovered depressed individuals to reduce negative emotions (e.g., Ehring, Tuschen-Caffier, Schnülle, Fischer, & Gross, 2010; Rood, Roelofs, Bögels, & Arntz, 2012) and from studies showing that cognitive (behavioral) therapy is an efficacious treatment for depression (Butler, Chapman, Forman, & Beck, 2006; Cuijpers et al., 2013; Dobson, 1989). However, some empirical findings also indicate that individuals scoring high on indicators of neuroticism (as trait found to be associated with depression; Jylhä & Isometsä, 2006) and depressed individuals themselves have difficulties in reappraising negative emotions (Barnow, Arens, & Balkir, 2011; Ehret, Joormann, & Berking, submitted; Ng & Diener, 2009a, b). CR relies heavily on cognitive executive functions — which are likely to be impaired in depressed individuals (Fossati, Ergis, & Allilaire, 2001; Gotlib & Joormann, 2010). Moreover, accessing more helpful cognitions by reappraising an emotion eliciting situation is a challenging task when these cognitions are incongruent with emotional and somatic states associated with depression (Gotlib &

Joormann, 2010; Joormann & Siemer, 2004; Singer & Salovey, 1988). Hence, prior research also shows that depressed individuals do not always benefit from CR (Arditte & Joormann, 2011; Diedrich, Grant, Hofmann, Hiller, & Berking, 2014).

These arguments and the inconsistent findings in the literature about the efficacy of CR raise the question whether factors moderating the efficacy of CR in depressed individuals can be identified. Unfortunately, research on the efficacy of ER strategies has so far neglected the moderating effects of contextual factors (Aldao, 2013; Coifman & Bonanno, 2010). Because of the dynamic nature of the ER process - likely involving the sequential or coactive implementation of multiple ER strategies during a given period of time - the complementary use of other ER strategies appears to be a promising candidate for such a significant contextual factor (Aldao, 2013; Berking, 2007; Berking & Schwarz, 2013; Berking & Whitley, 2014, pp. 19–27). Consistently, the ACE model includes the hypothesis that the efficacy of modification-focused strategies such as CR may be moderated by ER strategies used prior to (or in combination with) CR (Berking & Whitley, 2014). More specifically, Berking and Whitley (2014) assume that compassionate self-support and acceptance of one's current feelings are two ER strategies that may facilitate the utilization of modification-focused strategies such as CR. According to commonly applied definitions, *compassion* refers to the "sympathetic consciousness of others' distress together with a desire to alleviate it" (Merriam-Webster, 2014). Hence, *self-compassion* can be defined as a compassionate response towards one's own suffering (Berking & Whitley, 2014, p. 22; Berking, 2007; Gilbert, 2009; Weissman & Weissman, 1996). The concept of *emotion-focused acceptance* involves the openness to internal affective experiences and the willingness to remain in contact with them even if they are painful (Campbell-Sills, Barlow, Brown, & Hofmann, 2006). Both self-compassion and acceptance have been shown to effectively reduce the intensity of challenging affective states in depression (Diedrich et al., 2014; Liverant, Brown, Barlow, & Roemer, 2008; MacBeth & Gumley, 2012; Singer & Dobson, 2009).

Reasons to assume that self-compassion can also be used to facilitate CR in depressed individuals include the following. First, compassion involves empathy which can be considered a basic affective response (Singer & Lamm, 2009) that is generated in affect generating systems and taxes the resources of these systems (Singer, Seymour, O'Doherty, Kaube, Dolan, & Frith, 2004). As the affect-generating systems have limited processing capacities (Teasdale & Barnard, 1993), eliciting an affective compassionate response (i.e., empathy) towards the self can be assumed to replace affective states that are typically associated with depression (e.g., depressed mood) and that have been shown to interfere with accessing and utilizing positive cognitions (e.g., Joormann & Gotlib, 2007; Koster, De Raedt, Leyman, & De Lissnyder, 2010; Segal et al., 2006). Secondly, the compassionate response includes a supportive attitude towards the suffering self which can be assumed to interfere with depressogenic self-criticism likely to be cued during challenging tasks (such as utilizing CR) in depression-prone individuals (Gilbert, Clarke, Hempel, Miles, & Irons, 2004; Luyten et al., 2007; Mongrain & Leather, 2006). Thirdly, the action tendency associated with compassion is to help the suffering individual (Leiberg, Klimecki, & Singer, 2011). Therefore, self-compassion can be assumed to strengthen the motivation to engage in promising self-help strategies (such as CR) even if they are difficult to initiate and maintain (Berking & Whitley, 2014, p. 22). This effect may be particularly important in depressed individuals likely to suffer from motivational deficits when it comes to active problem solving (McFarland, Shankman, Tenke, Bruder, & Klein, 2006).

Additionally, it has been argued that the positive effects of self-

compassion are less strongly affected by an increase in depressed mood (or other affective states associated with depression) than are CR and emotion-focused acceptance (Berking & Whitley, 2014, p. 23; Diedrich et al., 2014). Whereas an increase of negative affect interferes with the activation and utilization of positive cognitions (e.g., Joormann & Gotlib, 2007; Koster et al., 2010; Segal et al., 2006) and the acceptance of an undesired mood state becomes more difficult as the intensity of this mood state increases (Diedrich et al., 2014; Singer & Dobson, 2009), compassion grows even stronger when the affective state the observed person suffers from deteriorates (Hein & Singer, 2008). The latter may be explained by human desire to be happy and free of suffering (Neff, 2011). The greater suffering is, the greater the discrepancy between a current and a desired affective state is, as well. This in turn, may lead to having a greater empathetic wish and tendency to relieve suffering, i.e. to be compassionate. Preliminary evidence for this assumption comes from a study showing that, when compared with CR, the use of self-compassion was less effective in reducing mild-to-moderate depressed mood but more effective in reducing strongly depressed mood (Diedrich et al., 2014). Assuming that negative emotions are most intense at the beginning of an intentional regulation process in which several strategies are utilized sequentially, these findings suggest that using self-compassion might be a promising choice at the beginning of such a process that also utilizes CR albeit at a later stage. However, precursory effects of self-compassion on the efficacy of subsequent CR have not yet been investigated.

Acceptance of one's current emotions has been proposed as another adaptive ER strategy for depression as it might help depressed individuals to reduce the gap between a current aversive affective state and a desired affective state by lowering the desired state and hence reducing the extent to which depressed individuals are likely to become depressed over their current affective state (Berking & Whitley, 2014, pp. 137–139; Teasdale & Barnard, 1993, pp. 212–214). With regard to potential preparatory effects on CR, it can be assumed that acceptance of undesired affective states reduces the pressure to down-regulate these states and the fear of regulation failure which may interfere with adaptive regulation (Berking & Whitley, 2014, pp. 137–139; Eifert & Heffner, 2003; Feldner, Zvolensky, Stickle, Bonn-Miller, & Leen-Feldner, 2006). Thus, accepting unwanted affective states may also facilitate the successful application of change-focused strategies such as CR. However, as it can also be argued that enhancing acceptance may reduce the motivation to work for change and may even cue feelings of hopelessness and resignation (Kraaij et al., 2002), the arguments for positive precursory effects of acceptance on CR appear less stringent than the arguments for positive effects of self-compassion. Empirically, the efficacy of acceptance as a precursory strategy for CR has not yet been investigated.

In sum, despite growing insight into the importance of context variables in the efficacy of ER strategies (Aldao, 2013; Berking & Schwarz, 2013; Coifman & Bonanno, 2010) there are no studies investigating how the efficacy of specific ER strategies in depression depends on the precursory use of other strategies. Thus, in the present study we aimed to examine whether the efficacy of explicit CR in depressed individuals can be further improved by engaging these individuals in self-compassion or emotion-focused acceptance prior to engaging them in CR. More specifically, we predicted that — when compared to a waiting-control condition — the guided use of self-compassion or emotion-focused acceptance would lead to a greater reduction of depressed mood during subsequent explicit CR.

1. Method

The present experiment was part of a randomized controlled trial examining both stand-alone and augmentation effects of the Affect Regulation Training (Berking, 2007; Berking & Whitley, 2014) in individuals with MDD (Ehret, Kowalsky, Rief, Hiller, & Berking, 2014). As part of the outcome assessment of this trial, participants partook and completed an experimental paradigm designed to investigate their ability to down-regulate depressed mood pre- and post-treatment. Findings from the present research represent the pre-treatment evaluation. Results of the stand-alone efficacy of the ER strategies assessed in this paradigm have been published elsewhere (Diedrich et al., 2014). The present study used a sub-sample to investigate preparatory effects of ER strategies on the efficacy of CR. All hypotheses tested were formulated a priori and before the start of the study (Berking, 2007; Berking & Whitley, 2014, pp. 19–27, 137–139).

1.1. Participants

Participants were 54 individuals who met criteria for MDD, were fluent in German, and at least 18 years of age. Participants were excluded if they had a high risk of suicide, a substantial secondary gain linked to having the mental illness (e.g., entitlement to an early retirement pension for mental health reasons), an organic brain disorder, a serious medical condition, or severe cognitive impairment. In order to increase the external validity of the study, we included patients meeting criteria for comorbid disorders in addition to MDD, except for those with a current diagnosis of substance use disorder, psychotic disorder, or bipolar disorder. Sample characteristics for the entire sample as well as for the three respective subgroups (conditions prior to CR) are shown in Table 1.

1.2. Procedure

Participants who had reported depressive symptoms as their main complaint when they had signed up for treatment at the outpatient department of the University of Mainz were contacted by phone by student assistants employed in the project. In these pre-screening interviews, the research project was introduced and inclusion- and exclusion-criteria were checked. The provisionally selected participants were then invited to an intake interview with a certified clinical psychologist who rechecked their eligibility for participation in the study, assessed the diagnostic status of MDD, screened for possible comorbid disorders, and assessed suicide risk. Next, study therapists, who treated patients after completing the experiment, conducted an intensive assessment to gather data about current diagnostic status, any relevant mental health problems, and the participant's personal, psychosocial, psychiatric, and medical history. After the assessment and prior to the start of treatment, eligible participants took part in the experiment.

The entire experimental procedure took approximately 60 min. Upon arrival at the laboratory, participants were asked to sit at a desk in front of a Dell Optiplex 740 MT computer. The experiment was administered with Presentation software (Neurobehavioral Systems, Albany, CA). The investigator left the room when the experiment started. The experiment consisted of four negative mood induction phases and four respective ER phases. Each participant had to rate his/her mood at baseline, as well as before and after each mood induction and ER phase. Negative mood was induced with low-mood inducing music (extract from "Adagio in G minor" by Tomaso Giovanni Albinoni) which was played in the background and a modified Velten mood induction procedure (Velten, 1968). As part of the Velten procedure, participants were asked to read ten depressing statements (e.g., "I think I am a loser.") which were each presented sequentially on a page on the computer screen. Next, participants were given the instruction to try to focus on and experience the mood activated by the statements. The

Table 1
Sample characteristics.

Demographic & clinical characteristics	Total ($N = 54$)	Acceptance prior to CR ($n = 18$)	Self-compassion prior to CR ($n = 18$)	Waiting prior to CR ($n = 18$)	Test statistic (χ^2/ F)	p
Gender n (%) female, χ^2	35 (64.8)	12 (66.7)	13 (72.2)	10 (55.6)	1.14	0.57
Age range, M (SD), F	18–63	20–57	18–56	19–63	1.13	0.33
	35.59 (11.49)	33.22 (11.24)	34.78 (9.53)	38.78 (13.29)		
High School n (%), χ^2	31 (57.4)	11 (61.1)	11 (61.1)	9 (50)	0.61	0.74
Marital status n (%), χ^2					6.85	0.14
Single	31 (57.4)	14 (77.8)	9 (50.0)	8 (44.4)		
Married	15 (27.8)	3 (16.7)	7 (38.9)	5 (27.8)		
Separated/Divorced	8 (14.8)	1 (5.6)	2 (11.1)	5 (27.8)		
MDE n (%), χ^2					1.60	0.45
Single	11 (20.4)	2 (11.1)	5 (27.8)	4 (22.2)		
Recurrent	43 (79.6)	16 (88.9)	13 (72.2)	14 (77.8)		
MDE Severity n (%), χ^2					1.67	0.80
Mild	16 (29.6)	6 (33.3)	4 (22.2)	6 (33.3)		
Moderate	36 (66.7)	12 (66.7)	13 (72.2)	11 (61.1)		
Severe	2 (3.7)	0	1 (5.6)	1 (5.6)		
Comorbidities n (%) yes, χ^2	31 (57.4)	9 (50)	12 (66.7)	10 (55.6)	1.06	0.59
Dysthymia	6 (11.1)	1 (5.6)	3 (16.7)	2 (11.1)		
Anxiety Disorders	22 (40.7)	8 (44.4)	9 (50)	5 (27.8)		
Somatoform Disorders	3 (5.6)	0	1 (5.6)	2 (11.1)		
Eating Disorders	3 (5.6)	2 (11.1)	0	1 (5.6)		
Personality Disorders	6 (11.1)	1 (5.6)	3 (16.7)	2 (11.1)		

Note. MDE = Major Depressive Episode. CR = Cognitive Reappraisal. As all participants were Caucasians we do not report differences with regard to ethnicity. High School ≈ German equivalent of High School Certificate after 13 years of schooling. Test statistic = χ^2 for categorical variables and F for continuous variables.

effectiveness of the Velten procedure (Gerrards-Hesse, Spies, & Hesse, 1994; Westermann, Spies, Stahl, & Hesse, 1996), of mood-suggestive music (Westermann, Stahl, & Hesse, 1996), and of the combination of both methods has been demonstrated in previous research (Westermann et al., 1996).

ER strategies were introduced by the presentation of the following sentence on the computer 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 continue" (translated from German). By clicking the mouse button, subjects could start an audiotape of the instructions for one of the three ER strategies and were to follow the instructions. The instructions for the CR condition were developed by the authors on the basis of a common procedure to challenge dysfunctional thoughts used in cognitive therapy (e.g., Beck, 2011). The instructions for acceptance and self-compassion represent abbreviations of the audio sequences of these skills contained in the Affect Regulation Training (Berking & Whitley, 2014; Berking, 2007). Specifically, the instructions for the three strategies were as follows:

1.2.1. Explicit reappraisal

"Please read the statements again carefully. Choose one statement you can identify with and which influences your mood in a particularly negative way, and click on it. Read it 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 when you think like that? Does this thought help you behave in the way you want? Then please think about which arguments would validate this statement and whether you have had experiences in the past that are consistent with this statement. Then, consider carefully whether there are also arguments against this statement. Maybe you can also identify experiences you have had 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."

1.2.2. Self-compassion

"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, by visualizing the way you look, sitting here in front of the computer. Maybe you can notice from the outside which feelings are upsetting you in 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. Once you experience 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 are experiencing 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 by saying to yourself: '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 may also visualize putting your hand on your shoulder or hugging yourself to soothe 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 in farewell. If so, do this now before you come back from this exercise to the here and now, slowly, in your own way."

1.2.3. Emotion-focused acceptance

"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, such as '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 prolonged 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."

1.2.4. Waiting condition

The computer screen displayed the following instructions: "There will now be a break of about 5 minutes. Please just remain seated calmly during this time. The program will signal the end of the break to you."

After the baseline-rating, each participant had to run through the sequence of induction phase, mood rating, regulation (or waiting) phase, and mood rating four times. This led to a total of nine mood ratings. Because there were three ER strategies and the waiting condition, 24 possible regulation sequences had been realized across the subjects ($4! = 24$). However, out of these 24 regulation sequences we only included participants with the 18 sequences in our analyses in which self-compassion, acceptance, or waiting were prescribed directly prior to CR. Hence, each partici-pant was clearly assignable to one of three groups (self-compassion before CR, acceptance before CR, or waiting before CR). This enabled us to investigate potential preparatory effects of self-compassion and acceptance (when compared to waiting) on CR. At the same time, this procedure ensured that CR was equally often carried out at the second, third, and fourth position of the experiment in all three groups. Participants from all groups underwent all four mood inductions and regulation phases. We included 54 participants which is a multiple of 18. Additionally, the subjects' pre-strategy mood ratings had to have a value of at least 10 (out of 100) on a visual analog scale so that the pre-mood was intense enough for participants to regulate it. The choice of this comparatively low threshold was based on the argument that research on cognitive and affective reactivity has shown that pre-existing, subtle mood deterioration may initiate depressogenic information processing in depression-prone individuals that may in turn lead to a vicious cycle of further mood-deterioration and increased depressogenic cognitions (Lau, Segal, & Williams, 2004; Segal, Gemar, & Williams, 1999; Teasdale & Barnard, 1993; Van Rijsbergen, Bockting, Berking, Koeter, & Schene, 2012).

Following the block of four negative mood inductions, for each participant a positive mood induction procedure was deployed once to foster disengagement from potentially remaining negative emotional states. At the end of the experimental session, subjects completed a short post-survey that comprised questions address-ing the extent of their difficulties in following the regulation in-structions of the ER strategies. Next, participants were debriefed and their mood was assessed. Had there been cases of strong adverse effects or even suicidal tendencies, crisis intervention strategies would have been applied by an experienced clinical psychologist. However, no such adverse event occurred. Moreover, participants were asked about their experiences with the entire experiment, including the investigated strategies. In response to this question, none of the participants reported having not at least

tried to apply the strategies. Written informed consent was ob-tained from all participants prior to the experimental session. Ethical approval for the study was provided by the ethics com-mittee of the Universities of Mainz and Marburg, Germany.

1.3. Assessment

Diagnoses were derived using the Structured Clinical Interview for DSM-IV Axis I and II Disorders (SCID; German version: Wittchen, Zaudig, & Fydrich, 1997). Certified clinical psychologists conducted the SCID-screening as well as the relevant sections on mood disorders, psychotic disorders, and substance use disorders, to ensure patients' eligibility for the study. Afterwards, the entire clinical interview (except for the sections on psychotic and sub-stance use disorders) was conducted by study therapists who had at least a Master's degree and were in advanced but not yet completed, clinical training. All therapists were trained in con-ducting SCIDs. The diagnostic assessments performed by study therapists were thoroughly discussed with an experienced super-visor. Participants who did not meet criteria for MDD in the second rating were excluded from the study. The inter-rater reliability between these two assessments for the diagnosis of MDD was excellent with Cohen's Kappa = 1.

During the experimental session, depressed mood was assessed at baseline, as well as prior to and after each mood induction and regulation phase. Participants rated their mood ("How depressed are you feeling at the moment?") on a computer-based visual analog scale composed of two vertical lines anchored at one end by the words "not at all" ($= 0$) and at the other end by the word "completely" ($= 100$). Each time they were asked to rate their mood, subjects had to place a mark at the point that best described their answer. During the post-survey, various potential difficulties for each strategy had to be rated on a 5-point- Likert scale ranging from 1 (not at all difficult) to 5 (completely difficult) (for more details, see Diedrich et al., 2014). Difficulties in following the instructions for self-compassion, acceptance, and CR had also been assessed in a healthy sample in another study (Ehret et al., submitted). Partici-pants of this sample did not differ regarding their difficulties in strategy application across strategies.

1.4. Data analyses

First, we wanted to rule out that our findings could be biased by differences in depressed mood before, during, and after the mood induction preceding CR depending on the preparatory condition (self-compassion, acceptance, waiting). Thus, we conducted a multivariate analysis of variance (MANOVA) with the between-subjects-factor strategy before CR (self-compassion, acceptance, waiting) and the dependent variables depressed mood pre- and post-mood induction preceding CR. Moreover, we conducted a 3 (strategy before CR [self-compassion, acceptance, waiting]) x 2 (time [depressed mood pre mood induction preceding CR, depressed mood post mood induction preceding CR]) repeated measures analysis of variance (ANOVA). Second, we aimed to rule out that our findings could be biased by differences in the difficulty of the application of the ER strategies. Thus, we calculated a repeated measures ANOVA with the within-subjects-factor diffi-culties in strategy application (mean difficulties in self-compassion, mean difficulties in acceptance, mean difficulties in CR). Third, we tested general differences across all preparatory conditions with regard to the reduction of depressed mood during subsequent CR with a 3 (strategy before CR [self-compassion, acceptance, waiting]) x 2 (time [depressed mood pre CR, depressed mood post CR]) repeated measures omnibus ANOVA.

To test our two separate primary hypotheses that the use of (1)

self-compassion and (2) emotion-focused acceptance would enhance the efficacy of subsequent CR, we employed two separate 2 (strategy before CR) x 2 (time [depressed mood pre CR, depressed mood post CR]) - repeated measures ANOVAS. In the first ANOVA, we compared self-compassion and waiting as preparatory conditions, in the second one we compared acceptance and waiting as preparatory conditions.

For all comparisons, we set at $p < 0.05$ (two-tailed). Effect sizes for ANOVAs, MANOVAs, and analyses of covariance (ANCOVAs) are reported as partial eta-squared (values of 0.01, 0.06, and 0.14 are considered to reflect small, medium, and large effects, respectively; Cohen, 1988). As effect sizes for t-tests we report Cohen's d (with small effect = 0.20, medium effect = 0.50, large effect = 0.80; Cohen, 1988). We used SPSS 19 for all analyses.

2. Results

2.1. Preliminary analyses

The MANOVA revealed no significant effect of the between-subjects-factor strategy before CR on depressed mood before and after the mood induction preceding reappraisal ($F(4,102) = 0.80$, $p = 0.53$, partial $\eta^2 = 0.03$). Moreover, the 3×2 repeated measures ANOVA did not show a significant interaction between time (depressed mood pre CR, depressed mood post CR) and strategy before CR ($F(2,51) = 1.55$, $p = 0.22$, partial $\eta^2 = 0.06$), indicating that there were no differences in changes in depressed mood during the mood induction phase prior to CR - depending on the experimental condition. This demonstrates that potential effects of self-compassion and acceptance on the efficacy of CR are neither explainable by a potential buffering effect on a prior negative mood induction nor by any effect on the intensity of the pre-regulation-mood. The effect size concerning difficulties in strategy application indicates that there might be a difference across strategies ($F(2,41) = 3.07$, $p = 0.06$, partial $\eta^2 = 0.13$). Table 2 shows that the application of acceptance is more difficult than the one of self-compassion whose application is again more difficult than the one of CR. However, this difference in difficulty level is statistically not significant. The omnibus test of differences across all preparatory instructions on subsequent changes of depressed mood during the CR instructions indicated that the efficacy of CR in reducing depressed mood varied almost significantly as a function of the preceding regulatory conditions (3×2 repeated measures ANOVA: time effect, $F(1,51) = 17.43$, $p < 0.001$, partial $\eta^2 = 0.26$; interaction effect of strategy before CR x time: $F(2,51) = 3.17$, $p = 0.05$, partial $\eta^2 = 0.11$).

2.2. Preparatory effects of self-compassion

To compare changes in depressed mood during the application of CR in participants who had used self-compassion before and those who had waited before, we conducted a repeated-measures ANOVA with the within-subjects-factor time (depressed mood

Table 2
Descriptive statistics for difficulties in application of self-compassion, acceptance, and CR.

Emotion regulation strategies	M	SD	Range
Self-compassion	3.26	1.01	1.00–5.00
Acceptance	3.51	0.72	1.67–5.00
Cognitive reappraisal	3.07	0.82	1.00–5.00

Note. Mean ratings, standard deviations and ranges for difficulties in the application of self-compassion, acceptance and CR; M = Mean; SD = Standard Deviation; CR = Cognitive Reappraisal.

pre CR, depressed mood post CR) and the between-subjects-factor strategy before CR (self-compassion, waiting). The ANOVA revealed significant effects for time, $F(1,34) = 13.78$, $p < 0.001$, partial $\eta^2 = 0.29$, and strategy before CR x time, $F(1,34) = 5.84$, $p = 0.02$, partial $\eta^2 = 0.15$. This indicated that participants in the self-compassion condition differed from those in the waiting condition with regard to the extent of changes in depressed mood during subsequently used CR. Findings remained unchanged when computing an univariate ANCOVA with depressed mood before CR as covariate, depressed mood post CR as dependent variable, and strategy before CR as factor ($F(1,33) = 5.86$, $p = 0.02$, partial $\eta^2 = 0.15$. The comparison between self-compassion and waiting as preparatory conditions barely missed the level of a Bonferroni-corrected alpha-level of 0.017. As shown in Fig. 1, depressed mood decreased significantly from an average level of 70.22 ($SD = 17.22$) to 50.78 ($SD = 20.40$) in those participants who had applied self-compassion before CR ($t(17) = 3.66$, $p = 0.002$; Cohen's $d = 1.03$). However, in those participants who had waited before CR, depressed mood only decreased from 67.22 ($SD = 23.94$) to 63.11 ($SD = 22.55$) which was not significant ($t(17) = 1.18$, $p = 0.25$; Cohen's $d = 0.18$).

2.3. Preparatory effects of emotion-focused acceptance

To examine changes in depressed mood during the application of CR in participants who had used acceptance before compared to those who had waited before, we conducted a repeated-measures ANOVA with the within-subjects-factor time (depressed mood pre CR, depressed mood post CR) and the between-subjects-factor strategy before CR (acceptance, waiting). The ANOVA revealed a significant effect for time, $F(1,34) = 5.17$, $p = 0.03$, partial $\eta^2 = 0.13$. However, the interaction of strategy before CR x time was not significant, $F(1,34) = 0.63$, $p = 0.43$, partial $\eta^2 = 0.02$. This indicated that CR was effective in reducing depressed mood, but this effect did not differ significantly depending on whether participants had used acceptance or waited before CR. Findings remained unchanged when entering depressed mood before CR as covariate in a univariate ANCOVA with depressed mood post CR as dependent variable and strategy before CR as an independent variable
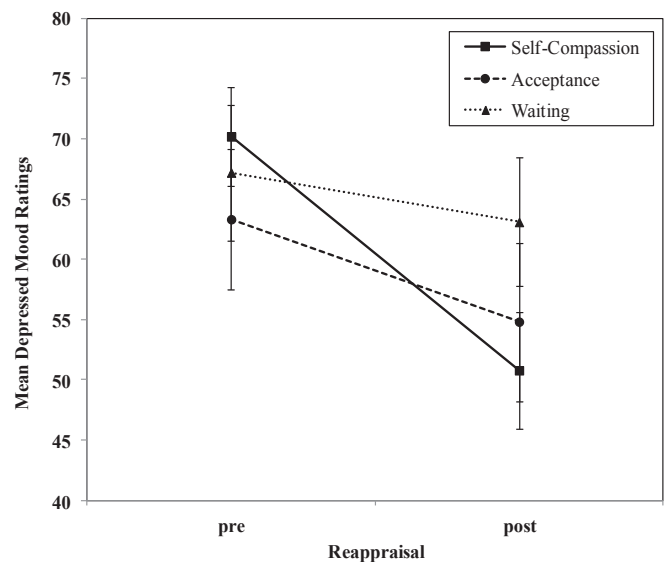

Fig. 1. Means and standard errors for depressed mood ratings before and after cognitive reappraisal for patients having applied self-compassion, acceptance or waiting beforehand.

$(F(1,33) = 0.90, p = 0.35,$ partial $\eta^2 = 0.03)$. As shown in Fig. 1, depressed mood decreased from an average level of 63.33 $(SD = 24.76)$ to 54.83 $(SD = 27.87)$ in those participants who had applied acceptance prior to CR (Cohen's $d = 0.32$) compared to a decrease from 67.22 $(SD = 23.94)$ to 63.11 $(SD = 22.55)$ in those participants who had waited before CR (Cohen's $d = 0.18$). Both reductions were non-significant (acceptance: $t(17) = 1.97, p = 0.07$; waiting: $t(17) = 1.18, p = 0.25$).

2.4. Post-hoc analyses

Since our primary analyses revealed that self-compassion significantly increased the efficacy of CR (when compared to waiting) whereas acceptance did not, we conducted a third 2×2 repeated-measures ANOVA with the within-subjects-factor time (depressed mood pre CR, depressed mood post CR) and the between-subjects-factor strategy before CR (self-compassion, acceptance) to clarify whether self-compassion was superior to acceptance. However, the interaction effect did not become significant, $F(1,34) = 2.56, p = 0.12$, partial $\eta^2 = 0.07$. This indicates no superiority of self-compassion over acceptance with regard to potential preparatory effects on the reduction of depressed mood during subsequent CR. A univariate ANCOVA with depressed mood scores pre CR did not change results substantially $(F(1,33) = 1.75, p = 0.20,$ partial $\eta^2 = 0.05)$.

To investigate to what extent the ability to use ER skills effectively to down-regulate depressed mood differs across skills, we also computed Pearson's correlations between the changes during self-compassion/acceptance and the changes during CR. Results showed that z-standardized changes in mood during self-compassion and emotion-focused acceptance were significantly associated with z-standardized changes during CR (when controlling for potential order effects) (acceptance-CR: $r = 0.39, p = 0.004$; self-compassion-CR: $r = 0.38, p = 0.01$). Additional analyses indicated that whether or not participants suffered from co-morbid disorders did not appear to affect the results.

3. Discussion

The aim of this study was to clarify in a sample of clinically depressed individuals whether the efficacy of explicit CR by purposefully identifying, challenging, and modifying depressogenic cognitions can be enhanced by the precursory use of self-compassion or emotion-focused acceptance. Results indicated that participants who utilized guided self-compassion prior to explicit CR experienced a significantly greater reduction of depressed mood during the application of CR than did participants who had simply been instructed to wait prior to CR. Conversely, participants who engaged in guided emotion-focused acceptance prior to explicit CR did not experience a significantly greater reduction of depressed mood during CR than did participants in the waiting condition.

These findings are consistent with the idea that contextual factors may moderate the efficacy of ER strategies and that these contextual factors likely include preceding ER strategies (Aldao, 2013; Berking & Whitley, 2014; Coifman & Bonanno, 2010). With regard to self-compassion, the findings are also consistent with previous research indicating that self-compassion is an effective ER strategy for depression (Diedrich et al., 2014; MacBeth & Gumley, 2012). Going beyond previous research, findings from the present study provide preliminary support to suggest that self-compassion may also help facilitate the effective use of other potentially effective ER strategies which depressed patients might find difficult to apply (e.g., Arditte & Joormann, 2011; Barnow et al., 2011). It should be taken into account, however, that only a trend of significance remained when a Bonferroni-corrected alpha-level was used. Thus, findings should be replicated and interpreted with caution. However, at the same time, it has to be considered that this is the first study examining the effects of two potentially relevant moderators on the efficacy of ER/CR in a clinical sample. Therefore, it might be argued that the risk of type I error is limited, even if our two primary hypotheses are considered as referring to one major hypothesis (which they are not).

The finding that emotion-focused acceptance was not associated with a significantly greater efficacy of subsequent CR suggests that ER strategies differ with regard to their effects on subsequent strategies. However, it is of note that the direct comparison between self-compassion and emotion-focused acceptance failed to attain the level of significance. Therefore, it has to be acknowledged that the non-significant comparison of emotion-focused acceptance versus waiting might be due to the limited statistical power of the present study, especially since evidence from previous studies has shown that acceptance as a stand-alone intervention does in fact have the potential to downregulate depression (Diedrich et al., 2014; Shallcross, Troy, Boland, & Mauss, 2010). Moreover, because of the comparatively short period of time between emotion-focused acceptance and subsequent CR, it cannot be excluded that emotion-focused acceptance is as effective as or even more effective than self-compassion with regard to facilitating CR, but that it takes longer to attain these effects (for the moderating effect of time on the efficacy of acceptance, see Campbell-Sills et al., 2006 or Liverant et al., 2008). Similarly, we cannot exclude that using other ways of guiding participants through emotion-focused acceptance (Martin & Dahlen, 2005, p. 1259) and/or training in acceptance (Rood et al., 2012) might have led to significant effects on CR — especially as participants in our study tended to experience more difficulties in the application of acceptance than of self-compassion. Moreover, in another study as well, a large proportion of recovered-depressed participants (40%) failed to adhere to an attitude of acceptance (Singer & Dobson, 2009). Furthermore, although none of the participants had reported that he or she had not at least tried to apply the strategies, we cannot completely exclude that some participants might not have told us so. Some participants might have refused to apply acceptance (and the other strategies) on purpose. For example, some might have had a negative attitude towards the entire experiment and others might have felt ashamed of not being able to follow the instructions and might thus have misreported their ability to use the strategies.

Additional limitations of the present study include the use of a laboratory setting, the potential conceptual overlap of the experimental conditions, and the lack of assessment of potential mechanisms of change. With regard to the laboratory-based experimental design, it is of note that the standardized procedures and the controlled setting allowed us to maximize the internal validity at the expense of the ecological validity of the study. Arguably, the efficacy of experimentally prescribed strategies to cope with standardized mood-induction material may differ from the efficacy of the same strategies when they are used in the patients' natural environment in regulating stimuli of greater personal relevance for participants. Therefore, future studies should seek to evaluate the effectiveness of ER strategies for coping with the effects of individualized mood-induction material in a natural context.

With regard to the potential conceptual overlap of the active regulatory conditions, it is important to consider that the present study did not aim to clarify significant moderators of interventions involving CR in the broad sense of changing cognitions to modify emotions. Nor did we seek to clarify significant moderators of interventions using CR to modify cognitions other than those directly cueing the affective state to be regulated. Certainly, both the self-

compassion and the acceptance condition induce mood-relevant cognitive changes in one way or another (as can arguably be assumed of all effective psychotherapeutic interventions and ER strategies; e.g., Jacobson & Hollon, 1996) and even, to some extent, explicitly use CR. However, in these two conditions, CR did not focus on stimuli cueing the depressed mood in the first place. Therefore, these conditions do not make systematic use of the specific and explicit way of utilizing cognitive re-appraisal to change the impact of depressogenic cognitions that was the focus of the present study (i.e., [a] becoming aware of the thoughts cueing undesired affective states, [b] reflecting upon/testing the validity/consequences of these thoughts, [c] purposefully developing more valid/helpful thoughts, and [d] using these thoughts to modify one's feelings). Thus, the importance of our findings lies in providing preliminary data indicating that it is possible to facilitate this specific way of using CR with specific interventions. As cognitive therapy may also use various other ways to modify pathogenic information processes (Hofmann, 2011), as facilitating the acceptance of symptoms has a long tradition in cognitive therapy (Ellis, 1962), and as self-compassion can be conceptualized as a cognitive technique (Allen & Leary, 2010), findings from the present study should not be interpreted as evidence against the efficacy of cognitive therapy, but rather as preliminary support for self-compassion as a therapeutic technique to enhance the efficacy of another cognitive strategy (e.g., explicit CR).

Nevertheless, we have to acknowledge that a certain degree of conceptual overlap cannot be excluded because the self-compassion condition included a limited period of time in which participants were free to "check if there are other things you want to tell yourself; things that would energize and encourage you to cheer yourself up." In this time period of approximately 12 s, participants might have engaged in the specific CR activities that were focused upon in the CR condition. Although this time period is rather short when compared with the time period unambiguously focusing on self-compassion (5 min), and although it can be argued that the preceding instructions should be more likely to cue unspecified self-soothing encouragements than the specific way of modifying emotional cues in a way focused in the CR condition, future studies working to replicate the findings from the present study should explicitly specify the self-compassion instruction to minimize the overlap between the two strategies.

With regard to the assumed mechanisms of change, future studies should systematically assess the arguably responsible factors of any effect of self-compassion or acceptance on the efficacy of explicit CR. The instructions for both self-compassion and acceptance contain several potentially responsible textual and technical components. While central textual ingredients of the self-compassion instructions include empathy, self-encouragement, and/or self-cheering up, acceptance instructions include nonjudgmental awareness, and tolerance of suffering. Moreover, instructions of both strategies involve perceptive, cognitive, and motivational components; beyond these, self-compassion instructions include imaginative and affective components. Hence, convincing theories explaining why and under what conditions both strategies including their sub-components may help to cope with undesired feelings, as well as both experimental and clinical research on these theories are clearly needed in order to clarify to what extent these concepts can be used to further advance psychological treatments for depression (Judd et al., 1998; Kupfer, Frank, & Phillips, 2012).

Additionally, future research should clarify whether the preparatory use of self-compassion (or other strategies) is more efficacious than investing the same time into intensifying the efforts to engage in (explicit) CR, particularly as evidence from another study indicates that difficulties in applying CR may be overcome through systematic training in CR (Ng & Diener, 2013). Moreover, as the present study exclusively focused on the down-regulation of depressed mood (as a core feature of depression), it remains unclear to what extent these findings can be generalized to other undesired affective states. Given evidence that various other undesired affective states arguably contribute to the development and maintenance of depression (e.g., Andrews, Qian, & Valentine, 2002; Besharat, Nia, & Farahani, 2013; Kim, Thibodeau, & Jorgensen, 2011) and that adding systematic training in general emotion regulation skills has been found to further enhance the efficacy of CBT for MDD (Berking et al., 2013), future research should also seek to identify the strategies that enable depressed individuals to cope effectively with affective states such as anxiety, fear, anger, shame and guilt. Furthermore, future research should aim to clarify to what extent preparatory strategies, such as self-compassion, may facilitate the successful application of other coping strategies focusing on depressed mood or other symptoms of depression. For example, because of its arguably positive effect on self-help motivation, it can be hypothesized that self-compassion may also facilitate strategies such as behavioral activation or active problem solving. Given that deficits in emotion regulation have been discussed as a risk and maintaining factor in various mental disorders, future research should finally examine whether the investigated strategies can be effectively utilized (as preparatory strategies) to reduce negative affect or symptom severity in other than depressive disorders, as well (e.g., Svaldi, Griepenstroh, Tuschen-Caffier, & Ehring, 2012).

Acknowledgements

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