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Relative Effectiveness of Reappraisal and Distraction in Regulating Emotion in Late-Life Depression

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Abstract

Objectives—The present study compares the effectiveness of two strategies, *reappraisal* and *distraction*, in reducing negative affect in older adults induced by focusing on personally relevant negative events and stressors. *Participants* included 30 adults with MDD and 40 never-depressed (ND) comparison participants ages 60 and over (mean age = 69.7 years).

Design and Measurements—Participants underwent three affect induction trials, each followed by a different emotion regulation strategy: distraction, reappraisal, and a no-instruction control condition. Self-reported affect was recorded pre- and post-affect induction, and at one-minute intervals during regulation.

Results—Across groups, participants reported greater reductions in negative affect with distraction than reappraisal or the no-instruction control condition. An interaction between group and regulation condition indicated that distraction was more effective in reducing negative affect in the MDD group than the ND group.

Conclusions—These results suggest that distraction is an especially effective strategy for reducing negative affect in older adults with MDD. Finding ways to incorporate distraction skills into psychotherapeutic interventions for late-life MDD may improve their effectiveness, especially for short-term improvement of affect following rumination.

Objective

Major depressive disorder (MDD) has been characterized as a disorder of emotion regulation, in which cognitive, behavioral, and biological processes that typically manage corrections to negative affect are less effective in modulating negative emotions (1). Individuals who cannot effectively manage their emotions or who rely on ineffective

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emotion regulation strategies are theorized to be at higher risk for both the onset and the prolongation of a depressive episode (2). What is less clear is which strategies are most likely to be effective regulators of affect. In particular, emotion regulation in the context of late life depression is of interest. Late-life MDD typically follows a chronic remitting course, which is exacerbated by age-related health and cognitive challenges (3, 4). Identifying regulation strategies that are maximally effective in this population may help to tailor psychosocial interventions to the unique needs of depressed elders.

Distraction is an emotion regulation technique in which attention is intentionally directed away from a negative stimulus and to a more positive or neutral topic. Distraction involves volitional, self-aware direction of attention to a chosen topic, and is differentiable from suppression ("trying not to" think, feel, or express something) or incidental distraction (e.g., being presented with a task that draws attention, without requiring an intention on the part of the participant to re-direct attention.) The recent comprehensive classification and meta-analysis of emotion regulation strategies by Webb et al. (2012) describes "active distraction" as one of the most effective strategies studied. The ability to self-distract is predictive of positive outcomes in infants and children (5), is associated with reductions in induced negative affect (6), and is associated with a lessening of the anxiety about, and experience of, physical pain (7). In healthy younger adults, distraction is preferred over reappraisal in high-intensity emotional contexts (8). Similarly, distraction may require less effort than other regulation strategies such as reappraisal when regulating emotion that has already arisen, while neither distraction nor reappraisal are associated with high cognitive effort when used in anticipation of an emotional stimulus (9). Distraction appears to interrupt emotion generation at an earlier stage than reappraisal, as indicated by an earlier reduction in the late positive potential (LPP) than reappraisal following emotional image exposure under EEG (10). There is indirect evidence that older adults may make more efficient use of incidental distraction than younger adults following an emotional stimulus (11). Thus, distraction may be a regulation strategy that is well-suited for use by older adults.

Reappraisal, meaning reframing or thinking differently about a stimulus in order to change its emotional tone, is currently one of the most studied emotion regulation strategies (e.g., 12) and is considered to be one of the most effective (13). Reappraisal has been found to reduce subjective, behavioral, and physiological indicators of negative affect (12, see 13 for a review, 14, 15) and to improve memory for negative stimuli (16), potentially reflecting deeper cognitive processing of the stimuli. Reappraisal is most effective when used as an antecedent-focused emotion regulation strategy, implemented before a full emotional response has developed (15, 17). Functional neuroimaging studies indicate that reappraisal involves an interaction between dorsal prefrontal cortex (PFC) regions involved in working memory and selective attention; ventral PFC regions associated with language and response inhibition; anterior cingulate regions responsible for cognitive control; medial PFC and frontal pole regions associated with reflecting on affective states; and emotion processing regions including amygdala and insula (12). This complex set of interconnecting functions is reflective of the cognitive processes required to hold a representation of a stimulus in mind (i.e., an appraisal), judge its emotional tone, generate an alternative representation (i.e.,

reappraisal), compare the emotional tone of the reappraisal with that of the original appraisal, and use executive resources to implement the chosen reappraisal.

Given the cognitive complexity required by reappraisal, it is not surprising that reappraisal use may be susceptible to disruption. Depressive symptoms are associated with reduced use of reappraisal (18–20), a reduction which may be exacerbated by reduced cognitive inhibition of negative stimuli (20). Use of reappraisal, but not distraction, was associated with less efficient downregulation of amygdala activation in individuals with remitted depression (21). Likewise, aging is associated with difficulty in reappraisal. Compared to younger adults, older adults report less success in downregulating negative affect via reappraisal in experimental contexts (22, 23, "detatched" but not "positive" reappraisal, 24), an effect which may be related to reduced PFC activation during reappraisal attempts (22, 25). In a recent study of older and younger adults tested at peak and off-peak points in the circadian cycle, older adults were less successful in regulating negative affect using reappraisal than a younger cohort, while no age differences were observed in regulation using an incidental distraction task (26). Overall, aging is associated with improved emotional control and ability to dampen negative emotions (27–29), with a corresponding reduction in the frequency (27, 30, 31) and intensity (27, 32, 33) of negative affect. That improvement tapers in the middle 70's and beyond (34). Several empirically grounded theories of emotional functioning in late life, including Carstensen's Socioemotional Selectivity Theory (SST; 35), Labouvie-Vief's Dynamic Integration Theory (DIT; 36), and Urry and Gross's Selection, Optimization, and Compensation with Emotion Regulation framework (SOC-ER; 37) converge on the idea that age-related cognitive changes place a limit on the emotional advantages conveyed by prioritization of emotion regulation, lifelong practice, and optimal strategy selection. Cognitive changes that accompany late-life depression (38) may threaten regulation success even further.

In addition, reappraisal has been found to be less effective than distraction under conditions of heightened emotional intensity (39). Sheppes and Gross hypothesize that strategies that interrupt emotion generation at a later point in the emotion generation cycle, such as reappraisal, may be more susceptible to interference by an ongoing and/or intense emotional experience. Strategies that interrupt emotion generation at an earlier point, such as distraction, compete with cognitive resources such as working memory and can effectively "block" processing of affective stimuli by filtering out information before it can be interpreted as negative (39). Given that MDD is characterized by chronic low mood, reappraisal attempts in MDD may frequently occur in the context of ongoing heightened negative emotional intensity, potentially reducing its effectiveness.

The goal of the current study is to compare the effectiveness of distraction and reappraisal in reducing negative affect in older adults with and without MDD. Our primary hypothesis is that distraction will be more effective than reappraisal in reducing negative affect among elders with MDD. Groups of older adults with and without MDD were recruited for the study. Participants were induced to negative affect by focusing on personally relevant negative topics. They were then asked to practice each of three regulation strategies: reappraisal, distraction, and a no-instruction control condition. Affect was measured at pre-induction, post-induction, and at 1-minute intervals during regulation. Differences in self-

reported affect were compared across strategies and groups. This is the first laboratory study of which we are aware that directly compares the effectiveness of reappraisal and distraction in adults of any age in a current major depressive episode.

Methods

Participants

A total of 30 adults with MDD and 40 never-depressed (ND) controls were recruited from previous participants in studies of aging and depression as well as online and newspaper advertisements. Exclusion criteria for both groups included age < 60 years; current or past psychosis or mania; estimated verbal IQ scores < 80; or MMSE scores < 27. Inclusion in the MDD group was contingent on a diagnosis of current MDD based on semi-structured interview with the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID I) (40). Depression symptom severity was measured by the Center for Epidemiological Studies Depression Scale (CESD; 41, 42). Cognitive function was assessed, as indexed by word fluency (FAS; 43) and visual attention, motor speed, and cognitive flexibility (Trail Making Test; 44), both normed by age and education level. ND participants were lifetime free of mood disorders based on SCID I interview. All participants consented to a protocol approved by the local Institutional Review Board at Duke University Medical Center (DUMC), and participants were paid $25 per session for participation.

Protocol

Participants were assessed for inclusion and exclusion criteria at an initial informed consent and diagnostic assessment session. Qualifying participants were scheduled for a separate experimental session. Both diagnostic and experimental sessions could take place either at DUMC or in the participants' home based on participant preference and transportation needs.

Tasks

A semi-structured interview was administered at the beginning of the experimental session to generate personally relevant negative topics, reappraisals of those topics, and a list of loved ones and positive memories for use as distractors. Personally relevant stimuli were chosen for affect induction over other means of affect induction (e.g., images) to allow for strong induction of negative affect in older adults. Previous studies have documented reduced reactivity to standardized affective images (45) as well as decreased gaze direction to negative images (46) in older adults, while age differences in subjective ratings of negative affect when exposed to personally relevant are minimal (47, 48).

Participants engaged in three emotion regulation tasks: reappraisal, distraction, and a no-instruction control task. Tasks were administered using a laptop computer, assisted by an experimenter. The no-instruction task was administered first, followed by the other two tasks in counterbalanced order. The no-instruction task was always administered first as spontaneous regulation was thought to be the most susceptible to carry-over effects of other instructions. The structure of each task included a two-minute rumination period where participants were instructed to focus on personally relevant negative topics in order to

"create a ruminative or worrisome state of mind"[1], followed by a three-minute instructed regulation period. Affect was queried pre-induction, post-induction, and at one-minute intervals throughout the regulation period. Brief breaks separated each task, during which time participants completed questionnaires and other study paperwork. At the conclusion of each task, participants were asked to rate their success in using the strategy. Following the task, participants were invited to listen to a five-minute relaxation tape to help recover from any remaining effect of the affect induction. The structure of the task was based on a previous study of affect regulation (49). Depression symptoms as measured by the CESD were assessed at the end of the session.

During the *reappraisal* task, participants were instructed to turn their attention to a series of statements designed to help them re-evaluate or reassesses the stressful situation in a less negative light. These statements included situation-specific statements generated by the participant as a part of the initial semi-structured interview, as well as stock reappraisals (e.g., "I have made it through tough times before, and I'll make it through this.") Each statement was displayed on the screen for 20 s, and participants were asked to repeat the statements to themselves and to think about how the statements applied to their own situation. Each statement was repeated three times over the regulation period. For *distraction*, participants were instructed to turn their attention and thoughts to a series of statements about their loved ones and positive memories, again with a mix of personally relevant and stock statements (e.g., "Think about [loved one]. What are your favorite things about him/her?") Again, each statement was displayed on the screen for 20 s, and participants were asked to repeat the statements to themselves and to think about how the statements applied to their own situation. Each statement was repeated three times over the regulation period. Finally in the *control* condition, participants were instructed to "spend a few minutes doing whatever you would normally do with your mind if you wanted to stop yourself from ruminating or worrying about something." This instruction remained on the screen throughout the control regulation period.

Affect checks consisted of three five-point Likert scale items: depressed, anxious, and relaxed, with the latter reverse-scored. These prompts were based on those used in McLaughlin et al. (2007). Participants were asked to rate how much they were feeling each of the items at that time, with the scale ranging from "very slightly or not at all" to "extremely." The three items were averaged to form a composite negative affect score.

Results

Demographics and clinical status

The mean age across participants was 69.7 years. Within the MDD group, 17 participants were taking antidepressant medication (SSRI or SNRI); in addition, two control participants reported antidepressant use. Four MDD participants had one prior hospitalization, and one

[1]We refer to the two-minute rumination period as "mood induction" as opposed to the three-minute "regulation" period. It should be noted that rumination can itself be characterized as a form of emotion regulation, though one that often has maladaptive outcomes (2). Perhaps more accurately, our induction period could be characterized as mood induction via lexical presentation of personally relevant stressors, with mood effects augmented by maladaptive regulation via rumination. For the sake of parsimony, we will continue to refer to the rumination period as "mood induction."

had five prior hospitalizations. Six MDD participants were in their first depressive episode, 13 were in their second, third, or fourth episode, and the remainder reported 5 or more episodes. Hospitalization information was missing for two participants and previous episode information was missing for one participant. Groups did not differ in age, racial/ethnic background, estimated verbal IQ, FAS, Trails A, or Trails B, *p*'s > .05, but did differ in CESD score, $p < .0001$ (see Table 1).

Affect induction manipulation check

A 3 (Task: Reappraise, Distract, Control) x 2 (Time: Pre-induction, Post-induction) x 2 (Group: MDD, ND) repeated-measures ANOVA of composite affect scores was used to determine the success of the affect induction. Tests revealed a main effect of *time*, $F(1, 68) = 122.7$, $p < .0001$, consistent with an increase in negative affect post-induction; *group*, $F(1, 68) = 38.0$, $p < .0001$, consistent with greater negative affect in the MDD group; as well as *task*, $F(2, 136) = 11.8$, $p < .0001$. No interaction terms were significant, *p*'s > .05. Follow-up contrasts of the main effect of task revealed significantly higher negative affect in the control condition than the mean of the reappraise and distract conditions, $F(1, 70) = 19.0$, $p < .0001$, but no difference between the reappraise and distract conditions, $F(1, 70) = 0.89$, $p = .35$.

Task implementation

The control task instructed participants to "do whatever they would normally do" to regulate following rumination. It was therefore of interest to measure spontaneous use of distraction and reappraisal during this time. Following the control task, participants were queried for the degree that they spontaneously used both distraction ("To what extent were you trying to distract yourself by thinking of other things?") and reappraisal ("To what extent were you trying to think of your worries differently or in a better light?") on a 1–10 scale. The mean rating for distraction was 7.1 (SD = 2.9) and the mean for reappraisal was 4.5 (SD = 2.9). Ratings were missing for one participant. A 2 (Strategy: Reappraise, Distract) x 2 (Group: MDD, ND) repeated-measures ANOVA of those ratings was conducted. A main effect of strategy, $F(1,66) = 15.3$, $p < .0001$ reflected greater self-reported use of distraction than reappraisal across the sample. Importantly, there was no main effect or interaction with group, *p*'s > .10. In addition, medication status was not significant as a covariate, *p*'s > .10.

Participants rated their perceived success of implementing the reappraisal and distraction tasks. Ratings for both strategies were high, $Mean_{distract} = 8.6$, SD = 1.84; $Mean_{reappraise} = 7.2$, SD = 2.5. Those ratings were subjected to a 2 (Strategy: Reappraise, Distract) x 2 (Group: MDD, ND) repeated-measures ANOVA. Antidepressant medication status (medicated, unmedicated) was entered as a covariate; no main effect or interaction with medication status was significant, *p*'s > .10. Again, there was a main effect of strategy, $F(1,66) = 16.9$, $p < .0001$, but no main effect or interaction with group, *p*'s > .10. The main effect of strategy reflected greater self-reported success of distraction than reappraisal.

Emotion regulation effects

A 3 (Task: Reappraise, Distract, Control) x 4 (Time: Post-induction and 1, 2, and 3 minutes post-induction) x 2 (Group: MDD, ND) repeated-measures ANOVA of affect check scores

was used to assess the impact of each strategy on self-reported negative affect. Antidepressant medication status (medicated, unmedicated) was entered as a covariate; no main effect or interaction with medication status was significant, *p*'s > .10. There were main effects of time, $F(3,201) = 67.6$, p < .0001; task, $F(2,134) = 16.7$, p < .0001; and group, $F(1,67) = 28.0$, $p < .0001$. In addition, there were significant interactions between task and group, $F(2,134) = 7.0$, $p = .001$; and task and time, $F(6,408) = 4.8$, $p < .001$. The Time x Group and Task x Time x Group interactions were not significant, *p's* > .10. MDD participants reported greater negative affect across time points than the ND group, as indicated by the main effect of group. The Task x Group interaction was driven by relatively lower mood scores during distraction than the other two tasks in the MDD group, compared to the ND group. Between-group *t* tests of difference scores between averaged post-induction, T1, T2, and T3 affect ratings displayed greater difference scores ([Control – Distract] and [Reappraise – Distract]) for the MDD than ND group, $t(68) = 4.0$, $p < .0001$ and $t(68) = 3.0$, $p = .003$, respectively. There was no difference in the magnitude of the [Control – Reappraise] difference score between the two groups, $t(68) = 0.86$, $p = .40$ (see Figure 1). Affect scores decreased post-induction across the sample, consistent with the main effect of time. This effect was qualified by the Time x Task interaction. The distract task was associated with greater reductions in negative affect than reappraisal, with lower composite negative affect scores at 3 minutes post induction, $t(69) = 5.2$, $p < .0001$, despite no difference between tasks post-induction, $t(69) = 0.22$, $p = .83$. Reappraisal was associated with lower negative affect than the control condition at 1 minute post-induction, $t(69) = 3.55$, $p = .001$, but not at 3 minutes post-induction, $t(69) = -0.58$, $p = .56$ (see Figure 2).

Depression severity effects on regulation

In order to assess for the effects of depression severity on regulation, a 3 (Task: Reappraise, Distract, Control) x 4 (Time: Post-induction and 1, 2, and 3 minutes post-induction) repeated-measures ANOVA of affect check scores was conducted in the MDD group with CESD score entered as a covariate. The Task x Time x CESD interaction effect was significant, $F(6, 162) = 3.12$, $p = .006$. In order to better understand this interaction, difference scores in negative affect from post-induction to T3, reflecting degree of total post-induction regulation, were constructed for each task. Correlations between CESD scores and total regulation were calculated. There were no significant correlations between CESD scores and total regulation scores in the control and reappraisal tasks, p's > .10. CESD scores did show significant correlations with total regulation in distraction, $r(27) = .46$, $p = .02$. Higher depression scores were associated with a greater reduction in post-induction affect scores in distraction.

Conclusions

Across the whole sample, distraction was more effective than reappraisal in reducing subjective negative affect induced via rumination on personally relevant stressors. Participants reported more spontaneous use of distraction than reappraisal in the no-instruction trials, and perceived distraction as more successful than reappraisal in the instructed trials. Distraction was associated with lower negative affect than both reappraisal and control conditions throughout post-induction regulation. Reappraisal was associated

with lower negative affect than the control condition in the first minute of regulation, but this difference disappeared by 3 minutes post-induction.

As hypothesized, distraction appeared especially effective in the MDD group. Though the MDD and ND groups did not differ in the degree to which they used distraction in the control condition or in their perception of distraction success, differences did emerge in self-reported negative affect during regulation. Compared to the ND group, the MDD group showed a greater benefit for distraction over both reappraisal and the no-instruction control condition, while reappraisal did not show a similar benefit over the no-instruction condition. Greater depression severity was associated with greater reductions in post-induction negative affect in the distraction task, but not the other two tasks, suggesting heightened effectiveness of distraction as depression severity increases.

Our finding that distraction was more effective and perceived as easier to implement than reappraisal is consistent with previous studies of “online” regulation, in which regulation attempts are instituted after an emotional response has developed. In an online regulation context, distraction is more effective in reducing negative affect than reappraisal (9, 17, 50). It should be noted that when participants are instructed to begin regulation before the onset of an emotional trigger, reappraisal is often found to be the more effective regulator (10, 51), though perhaps less so in older adults (26). Distraction is not immune to timing effects: distraction used before rumination (rather than rumination followed by distraction) has been found to be more protective against overall negative affect (52) and is associated with better interpersonal problem solving (53). However, distraction appears to be less impacted by previous rumination than reappraisal in our results. Similarly, distraction has been found to be more effective in reducing negative affect (39) and is utilized more frequently (8) than reappraisal in especially intense emotional contexts. The personally relevant rumination-based affect induction used in the present study may have led to more intense negative affect than other standardized stimuli (e.g., emotional images), which may help account for the greater effectiveness of distraction in regulating affect.

Finally, distraction may be a strategy well-suited to older adults. Older adults are hypothesized to benefit from overlearned regulation strategies that rely on crystallized abilities rather than flexible processing (36). While reappraisal requires some cognitive flexibility in re-interpreting a specific stressor, distraction can be implemented regardless of the content of a negative thought or stimulus. Compared to younger adults, older adults report less success in downregulating negative affect via reappraisal in experimental contexts (“detatched” but not “positive” reappraisal, 22, 24, 25, 26), an effect which may be related to reduced PFC activation during reappraisal attempts (22, 25).

The finding that the MDD group benefitted from distraction even more than the ND group may be due to several factors. The MDD group rated their negative affect as higher overall than the ND group, and as noted earlier, distraction may be more effective in reducing intense negative affect (39). Using reappraisal, especially as an online regulation strategy, is more cognitively costly than distraction (9, 10, 17, 50), and thus may be especially challenging given the deficits in attention (38, 54), executive function (54–56), and affective cognitive control (57–59) that can accompany MDD, especially in late life. Indeed,

reappraisal is associated with less successful downregulation of amygdala activation in individuals with current (60) as well as remitted depression (21) in younger adults. These findings may explain why MDD symptoms are inversely correlated with reappraisal use (18–20), especially in the context of reduced cognitive inhibition of negative stimuli (20). Though often interpreted as a deficit in selection of regulation strategy – i.e., individuals with MDD are less likely to use a "successful" regulation strategy like reappraisal – the reduced use of reappraisal may be due to its reduced effectiveness in this population.

One advantage of reappraisal over distraction is that reappraisal use is associated with greater memory for regulated content (16) and reduced reactivity to that content upon re-exposure (10), which may confer more long-term regulation benefits. However, it is unclear if those effects are present in late-life MDD populations, or if the regulation attempt is unsuccessful in reducing negative affect. Clinically, these results support the use of using distraction as a regulation skill in situations where emotional intensity is high (61), though do not discount the use of reappraisal in less emotionally intense situations.

Interpretation of results is limited by the use of a non-standard assessment of state negative affect. The three-item query was used to minimize the disruption to participants in implementing the assigned regulation strategy. Minimal disruption was especially critical as performing the assessments could serve as a form of distraction, and thus inadvertently reduce the differences in effectiveness between strategies. Use of self-report as the sole measure of regulation success is a limitation, given that subjective assessment may be subject to demand characteristics, and does not capture the physiological, behavioral, and expressive components of emotional experience. There were several limitations with the no-instructed control task, including lack of counterbalancing in the order of presentation versus the reappraise and distract conditions; and lack of regular instruction throughout the task, compared to statements presented every 20 seconds in the active regulation tasks. Lack of counterbalancing was necessary to minimize carry-over effects of the instructed conditions, and the intent of the control task was to best tap naturalistic regulation abilities, which precluded specific instructions. However, these design considerations limit the interpretability of differences between the no-instruction and instructed conditions, as we cannot rule out the impact of the order of task presentation or differential instruction effects. Additionally, the no-instruction control condition may have been influenced by the pre-task interview in which reappraisal statements and distraction topics were generated, potentially leading to increased use of distraction and reappraisal during the control task. In fact, participants reported moderate use of both strategies in the control condition, with higher levels of distraction than reappraisal. However, given that both strategies were discussed pre-task the likelihood for differential impact on the two strategies was low. Our primary finding of more successful regulation in distraction than reappraisal is not challenged by limitations with the control condition.

Another limitation of the study was the mixed medication status of participants, with slightly over half of MDD participants reporting antidepressant medication use. However, medication use did not appear to moderate implementation of the emotion regulation strategies. Future studies would benefit from direct comparisons to a younger adult sample

to determine if the heightened effectiveness of distraction in late-life MDD is also present in younger adults with MDD.

Several aspects of the study speak to its clinical relevance. First, the use of personally relevant content to induce negative mood serves as an analogue to rumination, an important predictor of depression risk and treatment response (2). As compared to standardized stimuli (e.g., images), the use of personally relevant mood induction may more closely mirror negative affect experienced by individuals with MDD. The use of both standardized and personally relevant regulation statements, generated collaboratively with the experimenters (all of whom were trained clinicians, either advanced graduate students or a PhD-level psychologist) can be seen as an analogue to the kind of regulation training that might occur in psychotherapy. The regulation strategies themselves mirror regulation skills taught in empirically validated treatments for depression, both for reappraisal (cognitive therapy) and distraction (behavioral activation). One implication for our results is that in older adults with MDD, distraction may be a more immediately effective and accessible means of addressing negative affect stemming from rumination than reappraisal strategies. This is not to say that reappraisal is not an important regulation skill, given the empirical support for cognitive therapy as an effective intervention for late-life depression (62). Rather, the effectiveness of distraction in reducing negative affect should not be minimized, and patients may benefit from help in learning flexibility in selecting regulation strategies (e.g., distract when negative affect is especially high, and implement reappraisal when emotions are less intense.)

In closing, there is no single emotion regulation strategy that is most effective for all people in all contexts. Rather, individual factors such as age and psychopathology, as well as contextual factors such as when in the course of an episode of emotion the strategy is implemented, play a role in the ultimate effectiveness of a given regulation strategy. Distraction appears to be a more effective strategy than reappraisal for reducing negative affect following a ruminative stressor in older adults, especially for those with MDD. Finding ways to incorporate distraction skills into psychosocial interventions for late-life MDD may be beneficial, especially for short-term improvement of affect following rumination. Future research comparing other regulation strategies, such as acceptance or suppression, and forms of psychopathology, such as anxiety disorders, can further elucidate optimum regulation strategies for a given population.

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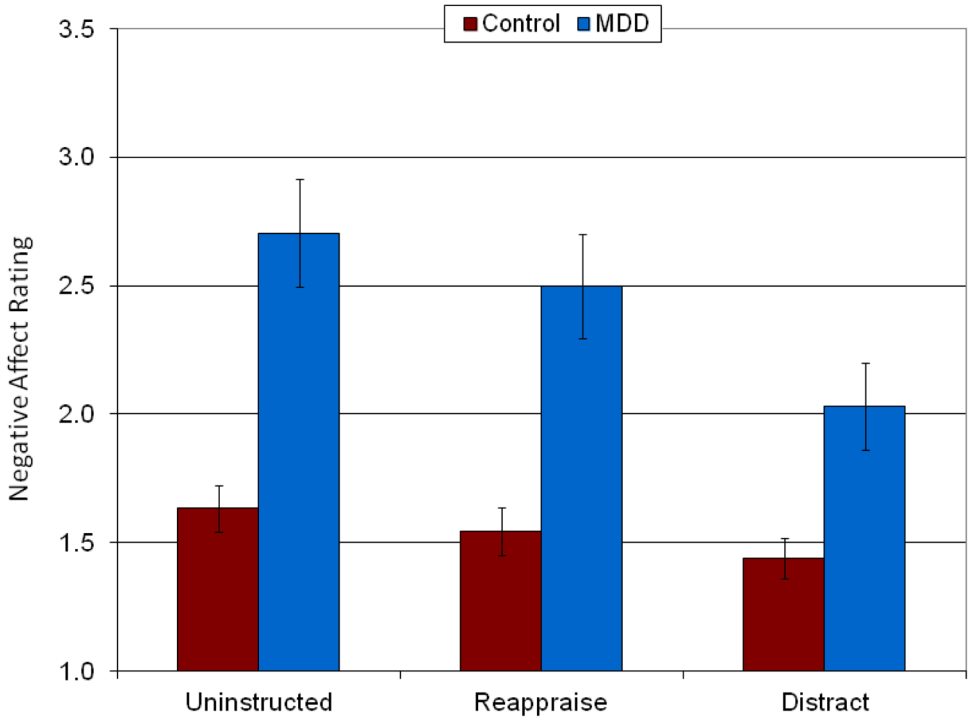

Figure 1.

Self-reported negative affect scores for each task. Values represent averaged ratings across the post-induction and 1, 2, and 3 minute post-induction rating periods. Error bars represent standard error of the mean.

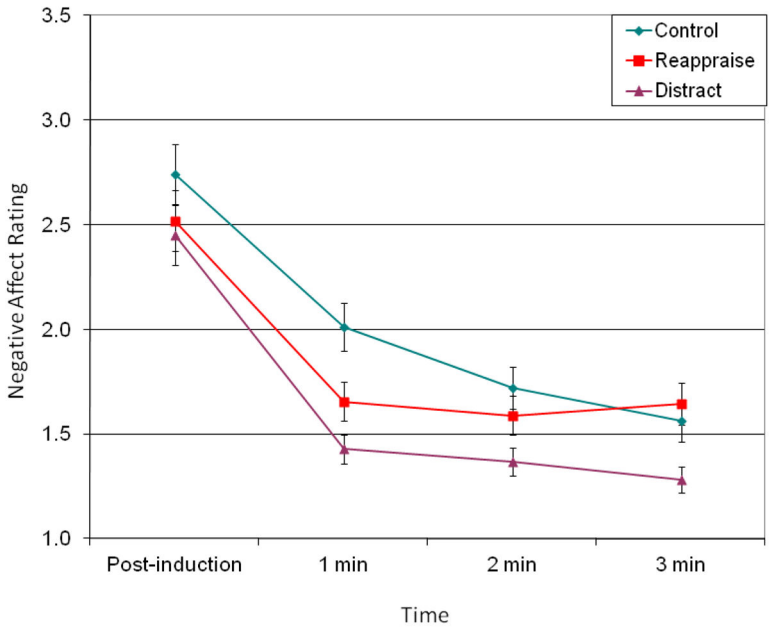

Figure 2.

Self-reported negative affect after the negative affect induction, and at one minute intervals post-induction. Lines represent the regulation tasks. Error bars represent standard error of the mean.

Table 1

Demographic and symptom severity information for control and MDD participants.
Two-tailed p-values for between-group *t* tests or chi-squared analyses are presented in the final column.

	MDD Group, n = 30 Mean (SD)	Control Group, n=40 Mean (SD)	*df*	*p*-value
Age	68.3 (6.3)	70.8 (7.1)	68	.124
Race			2	.556
African American	10%	3.3%		
Caucasian	87.5%	93.3%		
Did not indicate	2.5%	3.3%		
NAART VIQ	112.7 (5.4)	111.1 (5.4)	68	.628
FAS percentile[a]	53.6 (32.1)	53.8 (27.6)	54	.98
Trails A percentile[b]	48.7 (27.5)	51.6 (33.7)	66	.71
Trails B percentile[b]	34.2 (28.7)	48.4 (32.0)	66	.07
CES-D	29.9 (8.8)	3.0 (3.18)	68	<. 0001

NAART VIQ: North American Adult Reading Test

CESD: Center for Epidemiologic Studies Depression Scale

[a] MDD group n = 24, Control group n = 32

[b] MDD group n = 28