Research Article

Psychological Science
1–13

DOI: 10.1177/0956797615583295
pss.sagepub.com

Sad as a Matter of Choice? Emotion-Regulation Goals in Depression

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Abstract

Research on deficits in emotion regulation has devoted considerable attention to emotion-regulation strategies. We propose that deficits in emotion regulation may also be related to emotion-regulation goals. We tested this possibility by assessing the direction in which depressed people chose to regulate their emotions (i.e., toward happiness, toward sadness). In three studies, clinically depressed participants were more likely than nondepressed participants to use emotion-regulation strategies in a direction that was likely to maintain or increase their level of sadness. This pattern was found when using the regulation strategies of situation selection (Studies 1 and 2) and cognitive reappraisal (Study 3). The findings demonstrate that maladaptive emotion regulation may be linked not only to the means people use to regulate their emotions, but also to the ends toward which those means are directed.

Keywords

emotions, goals, depression, emotional control

Received 10/4/14; Revision accepted 3/30/15

Emotion regulation is a process by which people try to change current emotions into desired emotions (e.g., Bonanno, 2001; Mauss & Tamir, 2014). The outcome of emotion regulation depends on the emotional states desired (i.e., emotion-regulation goals) and on the means used to change emotions (i.e., emotion-regulation strategies). Research on maladaptive emotion regulation has focused on the strategies people use and how effectively they use such strategies. Little attention, however, has been focused on the possibility that maladaptive emotion regulation is also related to the *direction* of emotion regulation (e.g., toward happiness, toward sadness). We tested this possibility, by assessing emotion-regulation goals in people diagnosed with depression—a disorder characterized by emotion-regulation deficits (Joormann & Siemer, 2014).

Goals and Strategies of Emotion Regulation

People regulate their emotions to feel good, improve performance, promote social relationships, or maintain self-consistency (Tamir, 2015). These motives give rise to diverse emotion-regulation goals that differ across contexts (e.g., Tamir & Ford, 2012; Tamir, Mitchell, & Gross, 2008) and people (e.g., Tamir & Ford, 2012; Wood, Heimpel, Manwell, & Whittington, 2009). Such goals involve the increase or decrease of pleasant or unpleasant emotions (e.g., Tamir et al., 2008; Wood et al., 2009). Emotion-regulation goals are important because they determine the direction of emotion regulation. For example, people motivated to feel angry choose anger-inducing activities and subsequently experience more intense anger (e.g., Tamir, Bigman, Rhodes, Salerno, & Schreier, 2015; Tamir & Ford, 2012).

To achieve their emotion-regulation goals, people must effectively use emotion-regulation strategies. Emotion-regulation goals determine the direction of regulation, and emotion-regulation strategies determine how effectively people change emotions in the desired direction. The outcome of emotion regulation, therefore,

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depends on the emotion-regulation goal pursued and the efficacy of the strategies used to attain it. For example, to decrease negative emotions, people should direct emotion-regulation efforts toward decreasing negative feelings and use effective strategies to do so.

According to Gross (1998), emotion-regulation strategies must be employed before the full onset of emotional responses in order to be effective (i.e., antecedent-focused strategies). Situation selection is an antecedent-focused strategy that involves selecting stimuli (e.g., films, music) that are likely to change emotions (Gross, 1998). When using situation selection, the emotion-regulation goal determines the type of stimuli selected. For instance, people who want to increase happiness select happiness-inducing stimuli (e.g., Parkinson & Totterdell, 1999), whereas people who want to increase sadness select sadness-inducing stimuli (Hackenbracht & Tamir, 2010). Because situation selection involves selecting stimuli that induce desired emotions, the type of stimuli selected can index emotion-regulation goals (e.g., Tamir et al., 2008, 2015; Wood et al., 2009).

Cognitive reappraisal is another effective antecedent-focused strategy (Webb, Miles, & Sheeran, 2012). It involves changing the meaning of situations so that they yield different emotional responses (Gross, 1998). When using cognitive reappraisal, the emotion-regulation goal determines the direction in which events are reappraised. For instance, people who want to feel better think about situations in more positive terms, and those who want to feel worse think about situations in more negative terms (e.g., Ray, McRae, Ochsner, & Gross, 2010). Situation selection and cognitive reappraisal can both be used to increase or decrease emotional responses (e.g., Ochsner et al., 2004), depending on one's emotion-regulation goal. To date, research on maladaptive emotion regulation has focused on the efficacy of regulatory efforts. In contrast, we focused on the direction in which regulatory efforts are oriented. Specifically, we assessed the direction of emotion regulation in depression.

Emotion Regulation in Depression

Depression is characterized by prevalent unpleasant emotions, specifically sadness (American Psychiatric Association, 2013). The maintenance of such emotional experiences has been partly attributed to emotion-regulation deficits (e.g., Gross & Muñoz, 1995; Joormann, Siemer, & Gotlib, 2007), although such deficits are not yet fully understood.

Some evidence indicates that the strategies used by depressed people differ from those used by nondepressed people. Some studies found that depressed people use maladaptive strategies (e.g., rumination) more frequently and adaptive strategies (e.g., cognitive reappraisal) less frequently than nondepressed people (e.g., Aldao, Nolen-Hoeksema, & Schweizer, 2010; Garnefski & Kraaij, 2006; Nolen-Hoeksema, 1991). Some studies related depressive symptoms to difficulties implementing cognitive reappraisal (e.g., Beauregard, Paquette, & Levesque, 2006; Erk et al., 2010). Other evidence suggests that depressed people can effectively use cognitive reappraisal when instructed to do so (e.g., Dillon & Pizzagalli, 2013). Whether depressed people have trouble implementing strategies (e.g., reappraisal) or fail to select them is unclear.

We argue that in addition to understanding how effectively depressed people can change their emotions, it is important to identify the direction in which they try to change them. If depressed and nondepressed people try to change emotions in different directions, they may regulate such emotions in a manner that would result in different emotional experiences.

Emotion-Regulation Goals in Depression

People often seek emotions that increase pleasure and decrease pain. Unpleasant emotions are a source of psychological pain, especially in depression (Power & Dalgleish, 2008). One possibility, therefore, is that depressed people are less motivated than nondepressed people to experience unpleasant emotions, such as sadness. However, people also seek emotions that promote other benefits, regardless of immediate pleasure or pain (Parrott, 1993; Tamir, 2015). For example, people may be motivated to experience emotions that verify their sense of self (e.g., Swann, Stein-Seroussi, & Giesler, 1992). People with low self-esteem are less motivated to repair sad moods, partly because such moods are familiar to them (Wood et al., 2009). Likewise, people who experience more (vs. less) anger or fear are more motivated to experience anger or fear, respectively (Ford & Tamir, 2014). These findings raise the possibility that depressed people are more motivated than nondepressed people to experience unpleasant emotions, such as sadness. Such differences in emotion-regulation goals could lead them to implement emotion-regulation strategies in a direction that is likely to maintain, rather than decrease, unpleasant feelings.

The Current Investigation

We examined the extent to which depressed and nondepressed participants chose to increase or decrease sadness and happiness when implementing two emotion-regulation strategies: situation selection and cognitive reappraisal. Because situation selection involves selecting stimuli that induce desired emotions, it has been used previously to

index the desired direction of emotion regulation (e.g., Tamir & Ford, 2012; Tamir et al., 2008). Cognitive reappraisal has been studied among depressed people, who employ this strategy less frequently than nondepressed people (e.g., Garnefski & Kraaij, 2006; Joormann & Gotlib, 2010). Both strategies can be used to increase or decrease pleasant or unpleasant emotions.

To examine the direction in which depressed and nondepressed participants chose to implement situation selection, we asked participants to freely select emotion-inducing stimuli to which they wanted to be exposed (i.e., images in Study 1, music in Study 2). As another index of emotion-regulation goals, participants in Study 1 rated their preferences for sadness and happiness (e.g., Tamir et al., 2008). To examine the direction in which participants chose to implement cognitive reappraisal, in Study 3, we asked participants to choose whether to use reappraisal to increase or decrease reactions to sad and happy stimuli. We also tested participants' ability to implement cognitive reappraisal in their selected direction. To confirm that the selected direction of regulation did not reflect emotional inertia (Kuppens, Allen, & Sheeber, 2010), we controlled for concurrent emotions.

Study 1

Method

Participants. Participants were first prescreened for participation on the basis of their score on the Quick Inventory of Depressive Symptomatology self-report (QIDS-SR; Rush et al., 2003), which was administered online 2 to 3 weeks before the study to a large sample of students (N = 485). The ethical review board instructed us to omit the item "suicidal thoughts," and we adjusted cutoff values accordingly. Participants who scored between 0 and 5 or between 8 and 24 on the QIDS-SR were invited to participate in the study. During the laboratory session, to determine clinical status, we conducted clinical diagnostic interviews by administering the major depression episode (MDE) and dysthymia modules of the Mini International Neuropsychiatric Interview 5.0.0 (Sheehan et al., 1998).

Given that this is the first investigation to assess emotion-regulation goals in depression, we were unable to determine the required sample size on the basis of a priori power analyses. Therefore, we set the desired sample size to 30 in each group on the basis of an estimation of average sample sizes with similar populations. Anticipating that some participants might not meet diagnostic criteria, we invited 82 participants to participate in the study, 34 participants who scored 5 or below on the QIDS-SR, and 48 participants who scored 8 or higher.

The final sample included 61 female[1] students (mean age = 23.85 years), who received course credit or the equivalent of $13 for participating. Participants who scored 8 to 24 on the QIDS-SR and who were diagnosed with MDE or dysthymia based on the clinical interview were considered depressed (referred to hereafter as "depressed participants"; n = 31; mean QIDS-SR score = 12.00, SD = 2.83). Depressive symptoms may indicate the presence of major depressive disorder, dysthymia, or bipolar disorder. Participants who scored 0 to 5 on the QIDS-SR and who were not diagnosed with MDE or dysthymia based on the clinical interview were considered nondepressed (n = 30; mean QIDS-SR score = 2.73, SD = 1.57). Participants who met only one of the inclusion criteria (e.g., who had a qualifying score but no diagnosis of MDE/dysthymia) were excluded. Data from 2 nondepressed participants who failed to complete the study because of technical problems were not included in the analyses. In addition, 1 depressed participant chose not to complete the image-selection task. The two groups did not differ in age, $t(59) = 0.96$, $p = .340$; family status, $\chi^2(2, N = 61) = 1.34$, $p = .513$; or socioeconomic status, $\chi^2(1, N = 61) = 1.07$, $p = .300$.

Materials and procedure. The image-selection task included 10 sad, 10 happy, and 10 neutral images. We selected images from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2008) on the basis of the norms published by Lang et al. (2008) and by Mikels et al. (2005). We selected 4 sad images that were rated as inducing high levels of sadness (M = 4.87, SD = 1.7), 10 happy images that were rated as inducing high levels of amusement (M = 4.58, SD = 1.58) and contentment (M = 4.41, SD = 1.65), and 10 neutral images that were rated as inducing average levels of valence (M = 5.14, SD = 1.12) and relatively low levels of arousal (M = 3.18, SD = 1.95). We selected 6 additional sad images that were found to induce high levels of sadness in previous experiments (e.g., Vishkin et al., 2015). We also pretested these images in a pilot study with healthy Israeli participants (N = 25). The pilot study confirmed that sad images evoked more sadness (M = 6.43) than did happy images (M = 1.34) or neutral images (M = 1.31), $t(18)$s > 17.86, ps < .01, and happy images evoked more happiness (M = 6.64) than did sad images (M = 1.30) or neutral images (M = 2.56), $t(18)$s > 20.77, ps < .01. The pilot also confirmed that the sad images evoked significantly more sadness (M = 6.43) than they did fear (M = 4.06), anger (M = 3.73), or disgust (M = 2.59), $t(18)$s > 8.30, ps < .001.

The experiment was administered by a clinically trained psychologist. First, participants signed the informed-consent form. They were told that the goal of the experiment was to assess individual differences in reactions to various stimuli, such as images (the exact

Table 1. Results From Study 1: Depressed and Nondepressed Participants' Ratings of Their Emotional Reactions to the Images

Group and emotion rated	Image type		
	Sad	Neutral	Happy
Depressed			
Sadness	6.48 (0.29)	1.47 (0.10)	1.46 (0.10)
Happiness	1.17 (0.09)	2.20 (0.25)	6.06 (0.26)
Nondepressed			
Sadness	6.49 (0.29)	1.28 (0.10)	1.29 (0.10)
Happiness	1.39 (0.09)	2.38 (0.25)	7.03 (0.26)

Note: The table presents means, with standard deviations in parentheses.

wording of the instructions is available from the authors on request). Next, they rated the extent to which they felt sad and happy (1 = *very little*, 7 = *extremely*) and completed the image-selection task. Participants completed two training trials, and then the task itself.

On each trial of the image-selection task, an image was presented on the screen for 2,000 ms. Participants then pressed one key to see the image again for 4,000 ms or another key to watch a black screen for the same duration. Images were presented in a random order. On half the trials, participants pressed the "1" key to watch the image again and the "9" key to watch a black screen, and on half the trials the key assignment was reversed. Next, the participants rated their emotional reactions to the images. They viewed each image for 2,000 ms and rated the extent to which it made them feel sad and happy (1 = *not at all*, 9 = *extremely*). Images were presented in a random order. After completing the task, participants rated the extent to which they generally wanted to experience sadness and happiness (1 = *very little*, 7 = *extremely*). Finally, the psychologist administered the diagnostic interview.

Results

Manipulation check. We first tested whether the emotion-inducing images had the expected emotional impact and whether such impact was equivalent in depressed and nondepressed participants. Table 1 presents means and standard errors of emotional reactions to the images by group. We ran a repeated measures analysis of variance (ANOVA) with group (depressed, nondepressed) as a between-subjects factor and image (sad, neutral, happy) and emotional reaction (sadness, happiness) as within-subject factors. As expected, we found a significant Image × Emotional Reaction interaction, $F(2, 57) = 673.86$, $p < .001$, $\eta^2 = .92$. Follow-up comparisons confirmed that the sad images evoked more sadness ($M = 6.49$, $SE = 0.20$) than did the happy images ($M = 1.38$, $SE = 0.07$) and neutral images ($M = 1.37$, $SE = 0.07$), ps $< .001$. Likewise, happy images evoked more happiness ($M = 6.54$, $SE = 0.19$) than did the sad images ($M = 1.28$, $SE = 0.07$) and neutral images ($M = 2.29$, $SE = 0.17$), ps $< .01$. The Group × Emotional Reaction × Image interaction was not significant, $F(2, 57) = 1.52$, $p = .223$, $\eta^2 = .03$, which indicates that depressed participants did not differ from nondepressed participants in responding to sad images with sadness and to happy images with happiness.

The analysis also yielded a significant effect of image, $F(2, 57) = 257.89$, $p < .001$, $\eta^2 = .82$; on average, neutral images induced weaker emotional reactions ($M = 1.83$) than sad ($M = 3.88$) and happy ($M = 3.96$) images, ps $< .01$. The sad and happy images did not differ in the level of emotional reactions they induced, $p = .430$. There was also a significant effect of emotional reaction, $F(1, 58) = 6.78$, $p = .012$, $\eta^2 = .11$, such that participants generally reacted with more happiness ($M = 3.37$) than sadness ($M = 3.08$). Finally, we found a significant Group × Emotional Reaction interaction, $F(1, 58) = 6.63$, $p = .013$, $\eta^2 = .10$. Pairwise comparisons indicated that compared with nondepressed participants, depressed participants reacted with less happiness to all the images (nondepressed: $M = 3.60$, $SE = 0.16$; depressed: $M = 3.14$, $SE = 0.16$), $F(1, 58) = 4.41$, $p = .040$, $\eta^2 = .07$, but did not differ in their experience of sadness[2] (nondepressed: $M = 3.02$, $SE = 0.12$; depressed: $M = 3.14$, $SE = 0.12$), $F(1, 58) = 0.51$, $p = .479$, $\eta^2 = .01$. No other effects were significant, Fs < 1.86. The same pattern of results was obtained when we controlled for the number of sad images selected.

What type of images did depressed participants choose to watch? Table 2 presents descriptive statistics and simple correlations among our key variables. We predicted that depressed and nondepressed participants would differ in their selection of emotion-inducing stimuli. To test this prediction, we ran a repeated measures ANOVA with group (depressed, nondepressed) as a between-subjects factor and image (sad, neutral, and happy) as a within-subjects factor. As predicted, we found a significant Group × Image interaction, $F(2, 56) = 3.49$, $p = .034$, $\eta^2 = .06$ (see Fig. 1). Follow-up comparisons indicated that depressed participants chose to view significantly more sadness-inducing images ($M = 5.43$, $SE = 0.60$) than did nondepressed participants ($M = 3.62$, $SE = 0.61$), $F(1, 57) = 4.56$, $p = .037$, $\eta^2 = .07$.

Depressed and nondepressed participants did not differ in their selection of happiness-inducing images (depressed: $M = 9.67$, $SE = 0.10$; nondepressed: $M = 9.86$, $SE = 0.11$), $F(1, 57) = 1.77$, $p = .188$, $\eta^2 = .03$, or of neutral images (depressed: $M = 8.33$, $SE = 0.45$; nondepressed: $M = 7.83$, $SE = 0.45$), $F(1, 57) = 0.64$, $p = .429$, $\eta^2 = .01$. This interaction qualified a main effect of image, $F(2,$

Table 2. Results From Study 1: Descriptive Statistics and Simple Correlations Among the Key Variables

Measure	Mean	*SD*	Correlations					
			1	2	3	4	5	6
1. Group (depressed = 1, nondepressed = 0)			—					
2. Current sadness	1.28	1.58	.34*	—				
3. Current happiness	3.16	1.28	–.49*	–.14	—			
4. Self-reported preference for sadness	1.74	1.08	.34*	.42*	–.05	—		
5. Self-reported preference for happiness	6.59	0.78	–.30*	.11	.48*	–.11	—	
6. Number of sad images selected	4.54	3.36	.28*	.22	.01	.42*	–.24	—
7. Number of happy images selected	9.76	0.57	–.13	.16	.01	.13	–.11	.28*

Note: The table presents Spearman correlations for the categorical variable (group) and Pearson correlations for the continuous variables (current emotions, self-reported preferences, and number of images selected).
*$p < .05$.

56) = 96.15, $p < .001$, $\eta^2 = .63$, such that all participants selected more happiness-inducing images than sadness-inducing or neutral images. There was no main effect of group, $F(1, 57) = 2.73$, $p = .104$, $\eta^2 = .05$.

To test whether the differential selection of sad images among depressed and nondepressed participants was state-dependent, we ran an analysis of covariance (ANCOVA) with group (depressed, nondepressed) as the independent variable and the number of sad images selected as the dependent variable. Concurrent sadness and happiness were entered as covariates. The main effect of group remained significant, $F(1, 55) = 4.41$, $p = .040$, $\eta^2 = .07$. This finding indicates that differences in concurrent emotional experiences did not drive the differential selection of sadness-inducing stimuli by depressed and nondepressed participants.

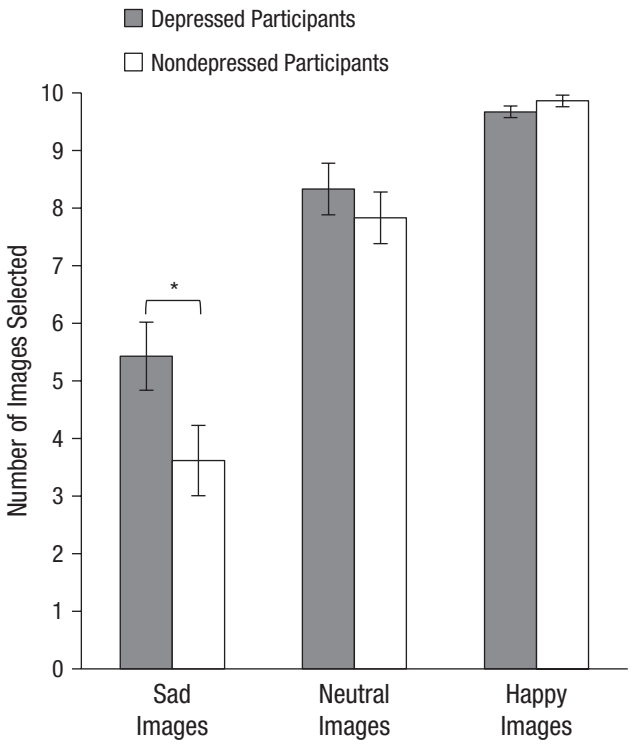

Fig. 1. Results from Study 1. The number of selected images of each type (sad, neutral, and happy) is graphed separately for depressed and nondepressed participants. Error bars represent ±1 *SEM*. The asterisk indicates a significant difference between groups ($p < .05$).

What do depressed participants say they want to feel? To test whether depressed and nondepressed participants differed in their self-reported emotional preferences, we conducted a repeated measures ANOVA with group (depressed, nondepressed) as a between-subjects factor and emotion (sadness, happiness) as a within-subjects factor. We found a main effect of emotion $F(1, 59) = 870.02$, $p < .001$, $\eta^2 = .94$, such that all participants reported stronger preferences for happiness than sadness.

There was no main effect of group, $F(1, 59) = 0.33$, $p = .569$, $\eta^2 = .01$. However, we found a significant Group × Emotion interaction, $F(1, 59) = 12.02$, $p = 0.001$, $\eta^2 = .17$, such that ratings of preferences for sadness were significantly higher among depressed participants ($M = 2.07$, $SE = 0.19$) than among nondepressed participants ($M = 1.40$, $SE = 0.19$), $F(1, 59) = 6.30$, $p = .015$, $\eta^2 = .10$, and ratings of preferences for happiness were significantly lower among depressed participants ($M = 6.36$, $SE = 0.14$) than among nondepressed participants ($M = 6.83$, $SE = 0.14$), $F(1, 59) = 6.19$, $p = .016$, $\eta^2 = .10$. Thus, although ratings of preferences for sadness were consistently low and ratings of preferences for happiness were consistently high, ratings of preferences for sadness were significantly higher and preferences for happiness were significantly lower among depressed participants than among nondepressed participants.

To test whether these effects depended on current emotions, we repeated the analysis with concurrent sadness and happiness as covariates. The Group × Emotion

interaction remained significant, $F(1, 57) = 4.55$, $p = .037$, $\eta^2 = .07$. These findings suggest that depressed and nondepressed participants' different preferences for sadness and happiness were not merely a reflection of state-congruent preferences.

Finally, participants' self-reported preference for sadness was positively correlated with their selection of sadness-inducing images, $r(59) = .42$, $p = .001$. This finding provides evidence for the convergent validity of our measures and suggests that both measures may reflect a motivation to experience sadness.

Study 2

In Study 2, we tested the generalizability of our findings by assessing the selection of another type of emotion-inducing stimulus—namely, music. Participants listened to sad, neutral, and happy music clips and selected one clip to listen to later in the session. In addition, in Study 1, sadness- and happiness-inducing stimuli were selected separately from one another. In Study 2, by asking participants to choose between stimuli, we tested whether depressed participants wanted to increase sadness relative to happiness or a neutral state. To rule out order effects, the order of tasks was counterbalanced.

Method

Participants. Because the Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996) is a more common measure of depressive symptoms than the QIDS-SR, participants in Study 2 were first prescreened for participation on the basis of their scores on the BDI-II, which was administered online to a large sample of students ($N = 503$) 1 to 3 weeks before the laboratory session. The sample size was determined as in Study 1. Following the procedure described in Study 1, we conducted clinical diagnostic interviews during the laboratory session to determine participants' clinical status. The final sample included 65 female students (mean age = 23.08) who received course credit or the equivalent of $13 for participating. Participants who scored 19 through 63 on the BDI-II and who were diagnosed with MDE or dysthymia based on the clinical interview were considered depressed ($n = 33$; mean BDI-II score = 27.58, $SD = 7.35$). Participants who scored 0 to 13 on the BDI-II and who were not diagnosed with MDE or dysthymia based on the clinical interview were considered nondepressed ($n = 32$; mean BDI-II score = 4.28, $SD = 2.54$). Participants who met only one inclusion criterion (e.g., who had a qualifying score but no diagnosis of MDE/dysthymia) were excluded. One nondepressed participant who failed to complete the study because of technical problems and another nondepressed participant who identified the purpose of the study were excluded from the final sample. The two groups did not differ in family status, $\chi^2(2, N = 65) = 0.985$, $p = .611$, or in socioeconomic status, $\chi^2(2, N = 65) = 0.749$, $p = .688$. There was a significant difference between the two groups in age, $t(63) = 2.44$, $p = .017$; depressed participants were slightly older ($M = 23.86$ years) than nondepressed participants ($M = 22.28$ years). However, all the analyses remained unchanged when we controlled for age.

Materials. To establish the reliability of our findings in Study 1, we used multi-item assessments of current sadness and happiness. Participants rated the extent to which they currently felt various emotions (1 = *very little*, 7 = *extremely*). To assess current sadness, we averaged their ratings for *sad, depressed, gloomy, downhearted*, and *melancholic* ($\alpha = .92$). To assess current happiness, we averaged their ratings for *happy, joyful, lighthearted*, and *cheerful* ($\alpha = .86$).

The music-selection task included two sad music clips ("Adagio for Strings" by Samuel Barber; "Rakavot" by Avi Balili), two happy music clips ("Track 8" by Jay Hannah; "Infernal Galop" from *Orpheus in the Underworld* by Jacques Offenbach), and two neutral music clips ("Pickles" by Edgar Meyer; "First Thing" by Four Tet). Each clip was of instrumental music and was approximately 2.5 min long. The music clips in each emotional category were identical in terms of genre (i.e., one classical and one modern).

Clips were selected on the basis of a pilot test in which healthy participants ($N = 37$) reported their emotional reactions to 30-s segments of the clips. These segments were subsequently used in the selection task in Study 2. Participants reported significantly more sadness in response to the sad clips ($M = 4.20$) than to the happy clips ($M = 1.29$) or the neutral clips ($M = 3.02$), $t(36)$s > 4.06, $p < .001$, and significantly more happiness in response to the happy clips ($M = 5.22$), than to the sad clips ($M = 1.81$) or the neutral clips ($M = 2.74$), $t(36)$s > 6.66, ps < .001. Participants also reported that the sad music clips induced significantly more sadness ($M = 4.20$) than fear ($M = 2.74$), anger ($M = 1.64$), or disgust ($M = 1.41$), $t(36)$s > 5.37, $p < .001$. Music clips of the different types were also perceived to be of equal complexity (Ms = 4.41, 4.78, and 4.26 for sad, happy, and neutral clips, respectively), $t(36)$s < 1.79, .08 < ps < .6; interest level, $t(36)$s < .42, ps > .674; and aesthetics, $t(36)$s < 1.03, ps > .311.

During the music-selection task, participants listened to a 30-s excerpt of each music clip in random order. Then they selected one clip they wanted to listen to in its entirety later in the experiment. Participants rated the extent to which each clip made them feel sad and happy (1 = *not at all*, 9 = *extremely*).

Procedure. The experiment was administered by a graduate student trained in clinical psychology. As in Study 1, participants were told that the goal of the experiment was to assess individual differences in reactions to various stimuli, such as music. Participants rated their concurrent emotional experiences and completed the remaining materials in one of two orders, determined at random. Specifically, half of the participants first listened to the music clips; immediately after each clip, they rated their emotional reactions to it. They then completed the music-selection task and listened to the music clip they had selected. The other half of the participants completed the music-selection task, listened to the music clip they had selected, and then rated their emotional reactions to each music clip. Finally, the experimenter administered the clinical diagnostic interview.

Results

Manipulation check. We first tested whether the music clips induced the intended emotional reactions in both depressed and nondepressed participants. To do so, we ran a repeated measures ANOVA with group (depressed, nondepressed) and order (music clips rated before or after the music-selection task) as between-subjects factors and music type (sad, neutral, and happy) and emotional reaction (sadness, happiness) as within-subjects factors. As expected, we found a significant Music Type × Emotional Reaction interaction, $F(2, 58) = 98.40$, $p < .001$, $\eta^2 = .63$. Follow-up tests confirmed that the sad music clips induced more sadness ($M = 4.24$, $SE = 0.26$) than did the happy music clips ($M = 1.52$, $SE = 0.13$) and the neutral music clips ($M = 2.22$, $SE = 0.17$), ps < .001. Likewise, the happy music clips induced more happiness ($M = 5.68$, $SE = 0.24$) than did the sad music clips ($M = 3.35$, $SE = 0.21$) and the neutral music clips ($M = 4.29$, $SE = 0.21$), ps < .001. The Group × Emotional Reaction × Music Type interaction was not significant, $F(2, 58) = 0.03$, $p = .973$, $\eta^2 < 0.01$, which indicates that depressed and nondepressed participants did not differ in the sadness they experienced in response to the sad music clips or in the happiness they experienced in response to the happy music clips.

The analysis also yielded a significant effect of music type, $F(2, 58) = 7.33$, $p = .001$, $\eta^2 = .11$, which indicates that, on average, the emotional reactions to the neutral music clips ($M = 3.25$) were weaker than the emotional reactions to the sad music clips ($M = 3.79$) and the happy music clips ($M = 3.60$), ps < .010. We also found a significant main effect of emotional reaction, $F(1, 59) = 51.43$, $p < .001$, $\eta^2 = .47$, such that participants generally reacted with more happiness ($M = 4.44$) than sadness ($M = 2.66$). Finally, we found a significant Group × Emotional Reaction interaction, $F(1, 59) = 15.75$, $p < .001$, $\eta^2 = .21$. Pairwise comparisons indicated that, compared with nondepressed participants, depressed participants reacted with more sadness to all music clips (depressed: $M = 3.19$, $SE = 0.21$; nondepressed: $M = 2.13$, $SE = 0.22$), $F(1, 59) = 12.05$, $p = .001$, $\eta^2 = .17$, and with less happiness to all music clips (depressed: $M = 3.98$, $SE = 0.23$; nondepressed: $M = 4.90$, $SE = 0.24$), $F(1, 59) = 7.53$, $p = .008$, $\eta^2 = .11$.

What type of music did depressed participants choose to listen to? We expected that depressed and nondepressed participants would choose to listen to different emotion-inducing music clips. To test whether depressed and nondepressed participants differed in their selection of music, we ran a multinominal logistic regression with group (1 = depressed, 0 = nondepressed) as the independent variable and selected music (1 = sad clip, 2 = neutral clip, 3 = happy clip) as the dependent variable. As expected, depressed and nondepressed participants differed significantly in their selection of music clips, $\chi^2(2, N = 65) = 14.32$, $p = .001$, $\lambda = .30$. Depressed participants were significantly more likely to choose sad music than to choose happy music, $b = 1.87$, Wald $\chi^2(1) = 8.07$, odds ratio (OR) = 6.50, $p = .004$, and were significantly more likely to choose sad music than to choose neutral music, $b = 2.21$, Wald $\chi^2(1) = 9.93$, OR = 9.10, $p = .002$. There was no significant difference between the two groups in their preference for happy rather than neutral music. Figure 2 depicts the percentages of depressed and nondepressed participants who selected each type of music clip.

To test whether these effects were state dependent, we repeated the analysis with current sadness and happiness as covariates. Depressed participants were still significantly more likely than nondepressed participants to select sad music than to select happy music, $b = 1.93$, Wald $\chi^2(1) = 4.42$, OR = 6.89, $p = .035$. However, the selection of sad music rather than neutral music was no longer significant, $b = 1.37$, Wald $\chi^2(1) = 2.09$, OR = 3.92, $p = .149$. There was no effect of concurrent sadness, $\chi^2(2, N = 65) = 1.91$, $p = .384$, or concurrent happiness $\chi^2(2, N = 65) = 0.03$, $p = .984$. To test whether these effects were order dependent, we repeated the analysis with the order of tasks (0 = music rating before selection task, 1 = music rating after selection task) as a predictor. Depressed participants were still significantly more likely than nondepressed participants to select sad music than to select happy music, $b = 1.78$, Wald $\chi^2(1) = 7.08$, OR = 5.94, $p = .008$, and to select sad music than to select neutral music, $b = 2.17$, Wald $\chi^2(1) = 9.26$, OR = 8.74, $p = .002$. There was no order effect, $\chi^2(2, N = 65) = 0.49$, $p = .784$. These results indicate that the difference between the two groups in the selection of sad rather than happy music did not depend on participants' current emotional state or on the order in which tasks were administered.

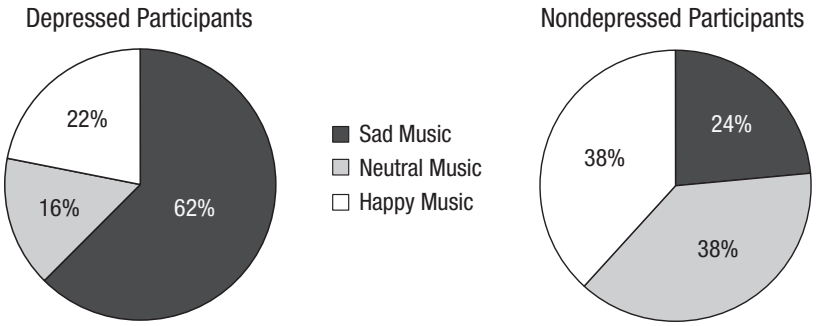

Fig. 2. Results from Study 2: the percentages of depressed and nondepressed participants who selected each type of music clip.

Study 3

In Study 3, we tested our hypothesis with a different emotion-regulation strategy. We also differentiated between the direction in which participants chose to implement a strategy and the efficacy with which they used it. We assessed the direction of cognitive reappraisal, how successful participants were in implementing it, and whether differences between depressed and nondepressed participants were due to objective ability, perceived difficulty, or effort.

Method

Participants. Participants were recruited and diagnosed according to the same procedure outlined in Study 2. Initial prescreening was based on scores on the BDI-II (Beck et al., 1996), administered online to a large sample of students ($N = 788$) 1 to 3 weeks before the laboratory session. The desired sample size was determined as in Studies 1 and 2. Clinical diagnostic interviews were conducted to determine participants' clinical status during the experimental session. During the interview, participants were further probed about the duration of the current depressive episode and about particular triggers for the current episode. The final sample included 61 students (mean age = 24.29; 46 women, 15 men), who received course credit or the equivalent of $12 for participating. Participants who scored 19 through 63 on the BDI-II and who were diagnosed with MDE or dysthymia based on the clinical interview were considered depressed ($n = 31$; 24 women, 7 men; mean BDI-II score = 27.32, $SD = 6.84$). Participants who scored 0 to 13 on the BDI-II and who were not diagnosed with MDE or dysthymia based on the clinical interview were considered nondepressed ($n = 30$; 22 women, 8 men; mean BDI-II score = 2.23, $SD = 2.57$). Participants who met only one inclusion criterion (e.g., who had a qualifying score but no diagnosis of MDE/dysthymia) were excluded. One nondepressed participant who identified the true purpose of the study was excluded from the final sample. The two groups did not differ in age, $t(59) = 0.218$, $p = .828$; gender, $\chi^2(1, N = 61) = 0.137$, $p = .711$; family status, $\chi^2(2, N = 61) = 1.05$, $p = .591$; or socioeconomic status, $\chi^2(2, N = 61) = 0.177$, $p = .674$.

Procedure. The procedure is depicted in Figure 3. The experiment was administered by a graduate student trained in clinical psychology. As in the previous studies, participants were told that the goal of the experiment was to assess individual differences in reactions to stimuli. Participants first reported on their current emotions. Then they viewed three sad images and three happy images. Participants viewed each image for 2,000 ms on the full computer screen and rated the extent to which it made them feel sad and happy (1 = *not at all*, 9 = *extremely*).

Participants were then trained in using cognitive reappraisal. The experimenter introduced cognitive reappraisal as an emotion-regulation strategy that can be used to either increase or decrease emotional reactions by ascribing a different meaning or interpretation to the emotional stimulus (Gross, 1998). The experimenter demonstrated how to use reappraisal to either increase or decrease an emotional reaction to a happy image. Participants were then requested to apply the technique four times: once to increase responses to a sad image, once to decrease responses to a sad image, once to increase responses to a happy image, and once to decrease responses to a happy image. During this training phase, the experimenter ensured that participants understood how to use cognitive reappraisal and that they did so appropriately in all four cases before proceeding with the study.

In the next stage of the study, participants completed a reappraisal selection task. On each trial of the task, one of the six emotional images previously rated by participants was presented on the screen for 500 ms, in random order. Participants were instructed to press one key if they wanted to increase their emotional reaction to the image or another key if they wanted to decrease their

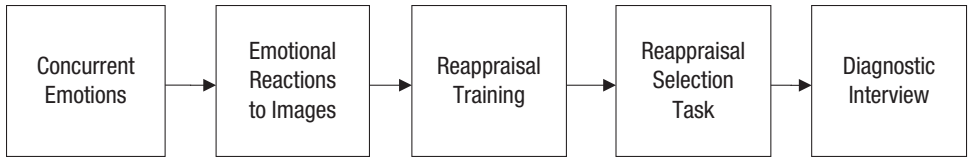

Fig. 3. Schematic depiction of the sequence of tasks in Study 3.

emotional reaction. On half the trials, participants pressed the "1" key to increase their emotional reaction and the "9" key to decrease it, and on half the trials the key assignments were reversed. Participants were told that people can have various motives for regulating their emotions. Sometimes they choose to decrease their emotional reactions and sometimes they choose to increase them, so there are no right or wrong choices.

After choosing whether to increase or decrease their emotional reaction, participants viewed the image for an additional 30 s. Participants were instructed to use cognitive reappraisal during that time to regulate their emotions in the chosen direction. After they reappraised, participants rated how sad and happy they felt (1 = *not at all*, 9 = *extremely*), briefly described how they reappraised the image, rated how difficult it was for them to regulate their emotions (1 = *not at all*, 9 = *extremely*), and rated how hard they tried to regulate them (1 = *not at all*, 9 = *extremely*). Finally, the experimenter administered the diagnostic interview.

Materials. We used the same measures as in Study 2 to assess current sadness ($\alpha = .96$) and happiness ($\alpha = .92$). The study included four sad and five happy images. Three images from each type were rated and included in the reappraisal selection task, and the remaining three images (two happy and one sad) were used in the reappraisal training. We selected images from the IAPs (Lang et al., 2008) on the basis of a pilot study with healthy Israeli participants ($N = 21$). This pilot study confirmed that sad images evoked more sadness ($M = 4.98$) than did happy images ($M = 1.26$), $t(20) = 12.5$, $p < .001$, and happy images evoked more happiness ($M = 4.92$) than did sad images ($M = 1.10$), $t(20) = 15.50$, $p < .001$. Participants also rated the sad images as evoking significantly more sadness ($M = 4.98$) than fear ($M = 1.80$), anger ($M = 1.87$), or disgust ($M = 2.10$), $ts(20) > 10.24$, $ps < .001$.

Results

Manipulation check. We first tested whether the images in the reappraisal selection task had the expected emotional impact and whether such impact was equivalent among depressed and nondepressed participants. We used participants' ratings of their emotional reactions to the images before the reappraisal task. We conducted a repeated measures ANOVA with group (depressed, nondepressed) as a between-subjects factor and image type (sad, happy) and emotional reaction (sadness, happiness) as within-subjects factors. As expected, we found a significant Image Type × Emotional Reaction interaction, $F(1, 59) = 608.96$, $p < .001$, $\eta^2 = .91$, such that the sad images induced significantly more sadness ($M = 6.11$, $SE = 0.20$) than happiness ($M = 1.26$, $SE = 0.09$), and the happy images induced significantly more happiness ($M = 6.01$, $SE = 0.22$) than sadness ($M = 1.59$, $SE = 0.12$), $ps < .001$. There was a significant Image Type × Emotional Reaction × Group interaction, $F(1, 59) = 12.79$, $p = .001$, $\eta^2 = .18$.

Depressed participants did not differ from nondepressed participants in their emotional reactions to sad images, $Fs < 1.13$, $ps > .292$. However, compared with nondepressed participants, depressed participants experienced less happiness in response to happy images (depressed: $M = 5.37$, $SE = 0.31$; nondepressed: $M = 6.64$, $SE = 0.31$), $F(1, 59) = 8.41$, $p = .005$, $\eta^2 = .13$, and experienced more sadness in response to happy images (depressed: $M = 2.00$, $SE = 0.17$; nondepressed: $M = 1.18$, $SE = 0.17$), $F(1, 59) = 12.29$, $p = .001$, $\eta^2 = .17$. We also found a significant Emotional Reaction × Group interaction, $F(1, 59) = 7.91$, $p = .007$, $\eta^2 = .12$, such that depressed participants generally experienced less happiness ($M = 3.35$) in response to all images compared with nondepressed participants ($M = 3.91$), $F(1, 59) = 4.68$, $p = .035$. There was no difference between the two groups in sadness evoked by the images, $F(1, 59) = 0.66$, $p = .419$. There were no other significant effects, $F < 2.61$. This finding indicates that depressed and nondepressed participants did not differ in their emotional reactions to sad images. However, depressed participants and nondepressed participants differed in their emotional reactions to happy images.

How successful were depressed participants in using cognitive reappraisal in the direction they had selected? We defined successful regulation as the ability to change emotional reactions to the image, in accordance with one's choice (i.e., either increase or decrease). Following validated procedures to assess successful regulation (e.g., Dillon & Pizzagalli, 2013; Ehring, Tuschen-Caffier, Schnülle, Fischer, & Gross, 2010), for each image, we subtracted the sadness or happiness rating

before regulation from the sadness or happiness rating after regulation. Successful regulation was operationalized as a change in emotional reaction in the desired direction. For each participant, we computed the percentage of successful attempts to regulate sadness and the percentage of successful attempts to regulate happiness.

On average, participants were successful in regulating their emotions on 60% of the trials. To test whether depressed and nondepressed participants differed in how successful they were in regulating their emotional reactions in the chosen direction, we ran a repeated measures ANOVA with group (depressed, nondepressed) as a between-subjects factor and image type (sad, happy) as a within-subjects factor. There was no effect of group, $F(1, 57) = 1.35$, $p = .251$, $\eta^2 = .02$, which indicates that depressed participants did not differ from nondepressed participants in their ability to use cognitive reappraisal to regulate their emotional reactions to sad and happy images, in the direction they had selected. No other effect was significant, Fs < 1.

In which direction did depressed participants choose to implement cognitive reappraisal to regulate their emotions? We first confirmed that participants used cognitive reappraisal appropriately to regulate their emotional reaction, in accordance with their chosen direction. Two independent raters rated participant's written descriptions of their reappraisals on each trial. There was high agreement between the judges (96.1% agreement), $\kappa = .76$, $p < .001$. In case of disagreements, the judges discussed the case until they reached an agreement. Participants used cognitive reappraisal appropriately and in the chosen direction on 92.8% of the trials. Trials on which cognitive reappraisal was applied inappropriately (1.2%), insufficient information was provided to assess the quality of reappraisal (0.7%), or reappraisal was applied in the direction opposite the one the participant had indicated (5.3%) were omitted from the analyses.

We predicted that depressed and nondepressed participants would differ in the direction in which they would choose to employ cognitive reappraisal in response to sad images. To test this, we conducted a repeated measures ANOVA with group (depressed, nondepressed) as a between-subjects factor and image type (sad, happy) as a within-subjects factor. As predicted, we found a significant Group × Image Type interaction, $F(1, 57) = 4.07$, $p = .048$, $\eta^2 = .07$ (see Fig. 4). Follow-up tests confirmed that depressed participants chose to increase emotional reactions to sad images ($M = 58\%$, $SE = 6.5\%$) significantly more often than did nondepressed participants ($M = 33\%$, $SE = 6.4\%$), $F(1, 57) = 7.32$, $p = .009$, $\eta^2 = .11$. The two groups did not differ in their choices to increase or decrease emotional reactions to happy images (depressed: $M = 76\%$, $SE = 5.5\%$; nondepressed: $M = 78\%$, $SE = 5.4\%$), $F(1, 57) = 0.06$, $p = .804$, $\eta^2 = .001$.

This interaction qualified a main effect of image type, $F(1, 57) = 23.07$, $p < .001$, $\eta^2 = .29$; on average, participants chose to increase emotional reactions to happy images more often ($M = 77\%$) than they chose to increase emotional reactions to sad images ($M = 45\%$). The interaction also qualified a main effect of group, $F(1, 57) = 4.72$, $p = .034$, $\eta^2 = .08$; on average, depressed participants chose to increase their emotional reactions more often ($M = 67\%$, $SE = 3.7\%$) than did nondepressed participants ($M = 55\%$, $SE = 3.7\%$).

Did the selected direction of regulation influence emotional experience in depressed and nondepressed participants? We expected that participants who chose to employ reappraisal to increase their emotional responses to sad images (compared with participants who did not) would experience more intense sadness after they engaged in reappraisal. To test this, we first computed the difference between the unregulated response to a sad image and the regulated response to that image, and then we averaged such differences across the sad images. We then correlated this average difference with the percentage of choices to use reappraisal to increase emotional reactions to sad images. As expected, the correlation was moderately strong and statistically significant, $r(60) = .42$, $p < .001$, which indicates that the more participants chose to use reappraisal to increase their emotional reactions to sad images, the more their sadness increased after regulation. We repeated this analysis separately for depressed and nondepressed participants. The correlation was significant among depressed participants, $r(30) = 0.44$, $p = .015$, but not significant among nondepressed participants, $r(30) = 0.27$, $p = .153$, possibly because nondepressed participants were far less likely to use reappraisal to increase emotional reactions to sad images. These findings demonstrate that among depressed participants, choosing to use reappraisal to increase emotional reactions to sad stimuli resulted in more intense sadness experience in response to these stimuli.

Were differences in the selected direction of regulation a result of inertia, reappraisal ability, perceived difficulty, or effort? We hypothesized that depressed participants chose to increase their emotional reaction to sad images because they were motivated to experience sadness. We tested four additional explanations. First, to test whether the relationship between depression and the selected direction of reappraisal in response to sad images was state-dependent, we ran an ANCOVA with group (depressed, nondepressed) as the independent variable and the percentage of choices to

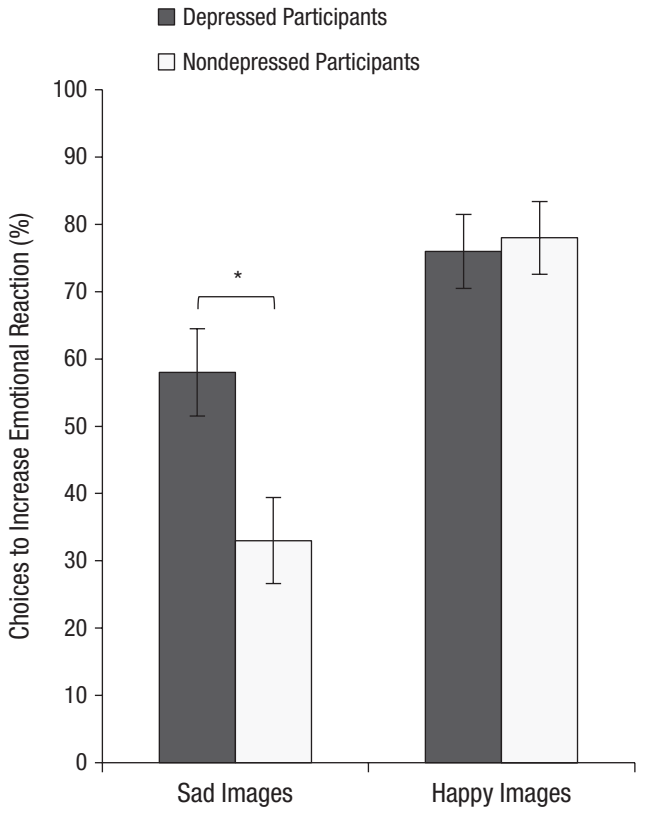

Fig. 4. Results from Study 3. Percentage of choices to increase emotional reaction is graphed as a function of image type (sad, happy), separately for depressed and nondepressed participants. Error bars represent ±1 *SEM*. The asterisk indicates a significant difference between groups ($p < .05$).

increase emotional reactions to sad images as the dependent variable. We entered concurrent sadness and happiness as covariates. The effect of group remained significant, $F(1, 56) = 4.82$, $p = .032$, $\eta^2 = .08$.

Second, to test whether the relationship between depression and the selected direction of reappraisal in response to sad images was qualified by participant's ability to regulate sadness, we ran a similar ANCOVA, but the percentage of successful attempts to regulate sadness was entered as the covariate. The effect of group remained significant, $F(1, 57) = 8.05$, $p = .006$, $\eta^2 = .12$.

Third, to test whether the relationship between depression and the selected direction of reappraisal in response to sad images was driven by perceived difficulty of regulation, we ran an ANCOVA in which we controlled for participants' reported difficulty in regulating sadness. As expected, the effect of group remained significant, $F(1, 57) = 9.80$, $p = .003$, $\eta^2 = .15$. There was no difference between depressed and nondepressed participants in reported difficulty of regulating responses to sad images, $t(59) = 0.966$, $p = .338$. Finally, to test whether the effect persisted when controlling for the effort invested in regulation, we ran an ANCOVA in which we controlled for participants' reported effort. Once again, the effect of group remained significant, $F(1, 57) = 5.78$, $p = .020$, $\eta^2 = .09$. There were no differences between depressed and nondepressed participants in the reported effort invested in regulating responses to sad images, $t(59) = 0.332$, $p = .741$.

These results indicate that differences in concurrent emotional experiences, efficacy of regulation, difficulty of regulation, or amount of effort invested in regulation were not responsible for the different choices of depressed participants (vs. nondepressed participants) to use cognitive reappraisal to increase their emotional reactions to sad images.

General Discussion

Our findings suggest that regardless of how well depressed people implement emotion-regulation strategies, they choose to implement them in a direction that is likely to maintain or increase sadness rather than alleviate it. In three studies, using two emotion-regulation strategies, we demonstrated that, compared with nondepressed participants, depressed participants directed emotion regulation toward experiencing more (rather than less) intense sadness. Although they could avoid sad images, depressed participants chose to view them more frequently than nondepressed (Study 1). Although they could listen to happy or neutral music, depressed participants were more likely to choose to listen to sad music (Study 2). Although they were trained in using cognitive reappraisal to decrease or increase reactions to sad pictures, depressed participants chose to increase reactions to sad pictures almost twice as often as nondepressed participants (Study 3). This pattern could not be attributed to differences in the ability to use reappraisal, perceived difficulty or effort.

Across studies, depressed participants chose to engage with stimuli that they rated as making them feel moderate to intense sadness. Their choices could not be attributed to differential reactivity to sad stimuli. Furthermore, effects persisted when controlling for current emotions and could not be attributed to mood congruency.

Our findings show that depressed participants (vs. nondepressed participants) regulated their emotions in a manner that was likely to maintain sadness but not necessarily decrease happiness. In Study 1, depressed participants chose to view more happy images than sad images and reported wanting more happiness than sadness. In Study 3, depressed participants chose to increase happiness more frequently than to increase sadness. However, when forced to choose between sadness and happiness in Study 2, most depressed participants wanted to listen to sad music rather than happy music or neutral

music. Because the selection of happiness-inducing stimuli was high in both groups in Studies 1 and 3, we cannot rule out the possibility that depressed participants wanted to increase happiness more than did nondepressed participants, but our procedures were insensitive to these differences because of ceiling effects. However, such a pattern would be inconsistent with the lower self-reported preferences for happiness among depressed people than among nondepressed people. Future research should examine preferences for sadness and happiness via different modalities, independently and in juxtaposition.

Future research should also identify why depressed people are more motivated than nondepressed people to experience sadness. One possibility involves self-verification motives (Swann, 1987). People with low self-esteem were more likely than people with high self-esteem to dampen positive mood (Wood, Heimpel, & Michela, 2003) and less likely to repair sad moods (Wood et al., 2009), partly because such moods were more familiar to them. Likewise, sadness is more familiar to depressed people than to nondepressed people. Therefore, they may be motivated to experience sadness to verify their emotional selves. People with low self-esteem also believed they deserve to feel bad (Wood et al., 2009). Because depression is linked to low self-esteem (e.g., Orth & Robins, 2013), depressed people may similarly believe they deserve to feel sad. Future research should examine what motives shape emotion-regulation goals in depression.

Future research should also identify the immediate and long-term implications of emotion-regulation goals in depression. Although increasing sadness may confer instrumental benefits (e.g., interpersonal advantages; see Forgas, 2013), it may be maladaptive if it ultimately maintains depressed people's dysphoria. Indeed, emotion-regulation goals may be responsible for some of the deficits in emotion regulation observed in depression. Future research should also test depressed populations in community samples and use measures other than self-report.

Depression is a complex and aversive condition, and people with depression struggle for relief. Yet, ironically, when it comes to emotional experiences, depressed people act in a manner that may ultimately maintain, rather than alleviate, the very states that characterize depression.

Author Contributions

M. Tamir and Y. Millgram developed the study concept. M. Tamir, Y. Millgram, J. Joormann, and J. D. Huppert contributed to the study design. Data collection and analyses were performed by Y. Millgram under the supervision of M. Tamir. M. Tamir, J. Joormann, and Y. Millgram drafted the manuscript. All authors approved the final version of the manuscript for submission.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Notes

1. Because depression is far more prevalent in women, we were unable to recruit men in Studies 1 and 2.
2. The term *emotional experience* refers to "self-reported experience of emotion" throughout this article.

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