

# Journal of Personality and Social Psychology

## **When There's a Will, There's a Way: Disentangling the Effects of Goals and Means in Emotion Regulation**

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Online First Publication, January 7, 2019. <http://dx.doi.org/10.1037/pspp0000232>

### CITATION

Tamir, M., Halperin, E., Porat, R., Bigman, Y. E., & Hasson, Y. (2019, January 7). When There's a Will, There's a Way: Disentangling the Effects of Goals and Means in Emotion Regulation. *Journal of Personality and Social Psychology*. Advance online publication. <http://dx.doi.org/10.1037/pspp0000232>

# When There's a Will, There's a Way: Disentangling the Effects of Goals and Means in Emotion Regulation

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Emotion regulation involves activating an emotion goal (e.g., decrease negative emotions) and using an emotion regulation strategy (e.g., cognitive reappraisal) to pursue it. We propose that activating emotion goals and implementing means can independently affect emotion regulation. People are not always motivated to regulate emotions or to regulate them in a prohedonic manner. Therefore, activating prohedonic emotion goals is consequential. Furthermore, merely activating an emotion goal may trigger accessible means, leading to emotional changes. We tested these ideas by disentangling effects of pursuing prohedonic emotion goals and implementing cognitive reappraisal. First, we show that individuals perceive measures and manipulations of cognitive reappraisal as signaling the activation of specific emotion goals (i.e., decrease unpleasant or increase pleasant emotions) and the implementation of specific means (i.e., think differently about emotion-eliciting events). Second, we decomposed a classic measure of cognitive reappraisal to show that previously documented benefits of reappraisal might be because of the frequency of either pursuing prohedonic goals or using cognitive reappraisal. Third, in 2 empirical studies, we separately manipulated prohedonic goals (without specifying the means), cognitive reappraisal (without specifying the goal), and gave classic reappraisal instructions (specifying both the goal and the means). In both studies, activating prohedonic goals was as effective in decreasing negative emotions as was activating prohedonic goals with reappraisal instructions. Thus, activating emotion goals is essential, and sometimes even sufficient, for successful regulation. Finally, we demonstrate that the confound between goals and means is pervasive in the cognitive reappraisal literature, and offer recommendations for avoiding it.

*Keywords:* emotion, emotion regulation, cognitive reappraisal, goals, motivation

*Supplemental materials:* <http://dx.doi.org/10.1037/pspp0000232.supp>

To reach a particular destination, people must be motivated to reach it and then use effective means to get there. Setting a destination increases the likelihood of getting there, because once it is set, various relevant means become accessible. For instance, the more people want to get to the museum, the more likely they are to get there (e.g., by walking, biking, or driving). We argue that

this also applies to emotion regulation, which involves an attempt to change a current emotion into a desired emotion, by using emotion regulation strategies (e.g., Gross, 2015). The outcome of emotion regulation depends on the emotion goal of regulation (e.g., to decrease sadness) and on the means with which it is pursued (e.g., thinking about a sad event in a manner that makes it

*Editor's Note.* Yuichi Shoda served as the action editor for this article.—MLC

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This work was supported by Grant I-324-105.1-2012 of the German-Israeli Foundation, granted to Maya Tamir and Eran Halperin.

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less sad). Emotional destinations vary across people and situations (for a review, see Tamir, 2016). We propose that setting a desired emotional destination (i.e., activating an emotion goal) can facilitate congruent shifts in emotional outcomes. Furthermore, we suggest that the contribution of activating emotion goals may have been overlooked, in part, because it has often been confounded with the contribution of implementing emotion regulation means (i.e., using specific emotion regulation strategies). We tested these ideas by focusing on one of the most effective and widely studied emotion regulation strategies—namely, cognitive reappraisal.

Multiple studies (see Gross, 2015; Webb, Miles, & Sheeran, 2012) demonstrate that leading people to use cognitive reappraisal (i.e., think about the situation in a way that changes its emotional impact; Gross, 1998) can make them feel better (e.g., McRae, Ciesielski, & Gross, 2012), suffer from fewer clinical symptoms (e.g., Kivity & Huppert, 2016) and promote adaptive social outcomes (e.g., Halperin, Porat, Tamir, & Gross, 2013). The efficacy of cognitive reappraisal is unequivocal. Nonetheless, we argue that at least some of the effects previously attributed to cognitive reappraisal may have been driven, in part, by motivating people to regulate their emotions in a specified direction. We further suggest that motivating people to decrease their negative emotions, in particular, is necessary and potentially as important as training them how to do so.

### Goals and Means in Emotion Regulation

There is a distinction in self-regulation between the goals people pursue as they regulate (i.e., *what* people regulate) and the means people use to pursue them (i.e., *how* people regulate; see Gollwitzer & Moskowitz, 1996; Lewin, Dembo, Festinger, & Sears, 1944). Goals and means are linked to each other in a hierarchical fashion, but each plays a unique role in shaping the outcomes of self-regulation. The goal determines the direction of self-regulation, whereas the means determine the efficacy with which the goal is pursued, with specific means varying in the resources they demand, their efficacy, and their costs and benefits (Kruglanski et al., 2012). Goals and means are distinct, but interrelated. For instance, goals often activate the means associated with them (Fishbach & Ferguson, 2007). A change in behavior, therefore, can result from the activation of a goal, from the activation of a means, or from the integration of both.

Like other forms of self-regulation, emotion regulation involves the activation of a goal to modify emotions (i.e., an emotion goal; Mauss & Tamir, 2014; Tamir, 2016), followed by the engagement of relevant means (i.e., emotion regulation strategies) for altering the trajectory of emotion in the desired direction (Gross, 2014). With respect to goals, although it is often assumed that people want to decrease negative feelings and increase positive feelings, considerable evidence indicates that emotion goals vary both across contexts and across individuals (for a review, see Tamir, 2016). The outcomes of emotion regulation, therefore, depend on which emotion goal people pursue. With respect to strategies, various emotion regulation strategies have been identified in the literature, and considerable research has been devoted to examining their efficacy (for a review, see Webb et al., 2012). The outcomes of emotion regulation, therefore, also depend on which emotion regulation strategy people use.

As in other instances of self-regulation and given the variability in the emotion goals people spontaneously adopt, adaptive emotion regulation may result not only from using adaptive emotion regulation means, but also from pursuing adaptive emotion goals. Because goals can automatically activate accessible means, we propose that merely instructing people to decrease their negative emotions may result in congruent changes in emotional experiences, even without telling people how to do so.

### Empirical Assessments of Goals and Means in Emotion Regulation

The important role of emotion goals in emotion regulation has been somewhat overlooked. We argue that this may be because the contribution of emotion goals and the contribution of emotion regulation strategies have often been confounded in the literature. This confound could lead to misattribution of effects and conceal the possibility that effects of specific emotion regulation strategies may depend on the emotion goal pursued rather than the particular strategy that is used. To examine emotion regulation in the laboratory, researchers often simultaneously manipulate the goal of regulation and the means used to pursue it. In some studies, this potential confound is minimized by holding the goal of regulation constant and comparing different means to pursue that goal (e.g., cognitive reappraisal vs. distraction; Sheppes, Scheibe, Suri, & Gross, 2011). In other studies, however, the goal and the means are manipulated simultaneously and compared with a control condition (e.g., Gross, 1998). In such studies, participants are often presented with stimuli that induce undesirable emotions. They are then instructed either to respond naturally to those stimuli or to decrease their emotions using the target regulation strategy. The target strategy is deemed effective if participants in the experimental condition experience less intense negative emotions after regulating their emotions, compared with participants in the control condition.

Studies that use such designs have made important contributions to our knowledge and understanding of emotion regulation (see Webb et al., 2012). However, we argue that they may have confounded the potential effects of activating prohedonic emotion goals (i.e., decrease negative emotions or increase positive emotions) and using particular means (e.g., cognitive reappraisal). This is because a prohedonic emotion goal is activated when people are instructed to decrease their negative emotions (whether using reappraisal or not), but it is not necessarily activated when they are instructed to respond naturally. If the activation of an emotion goal can automatically trigger accessible means, it may have an impact on subsequent emotional experiences, which may have been inappropriately attributed to the strategy that is being examined. Although we acknowledge that decreasing negative emotions and increasing positive emotions are distinct goals with potentially distinct implications, in the current investigation, we refer to both types of goals as prohedonic for the sake of simplicity.

If activating prohedonic emotion goals can account for some (or even all) of the effects previously attributed to certain emotion regulation strategies, this could have dramatic theoretical and applied implications. As a field, we have assumed that people are inherently motivated to feel better. This implies that prohedonic goals are constantly active, and effective changes in emotion regulation depend on providing people with effective (or goal-

appropriate) means to pursue these goals. Alternatively, however, people may have means for regulating emotions at their disposal, but they do not actively pursue prohedonic goals. This would imply that to promote desirable changes in emotional experiences, it may be critical to motivate people to pursue such changes. Accordingly, we propose that motivating people to regulate their emotions in a prohedonic direction may activate various accessible emotion regulation strategies, setting in motion regulatory efforts and resulting in desirable shifts in emotional experiences. To test these ideas, we introduce and seek to eliminate the potential confound between the activation of prohedonic goals and the implementation of regulation means, focusing on cognitive reappraisal.

### Goals and Means in Cognitive Reappraisal

Cognitive reappraisal, which involves changing the meaning of an emotion-eliciting event such that its emotional impact changes (e.g., Gross, 1998), is considered one of the most effective emotion regulation strategies (Webb et al., 2012). It can be effectively applied to either increase or decrease the intensity of either positive or negative emotions (e.g., McRae et al., 2012; Ochsner et al., 2004).

Some studies examined individual differences in the frequency of using cognitive reappraisal in daily life (e.g., Gross & John, 2003). Such studies found that more frequent use of cognitive reappraisal is linked to less negative emotions, more positive emotions, less depressive symptoms and anxiety, and greater well-being (e.g., Ehring, Tuschen-Caffier, Schnulle, Fischer, & Gross, 2010; Gross & John, 2003; Haga, Kraft, & Corby, 2009). However, if the measure of individual differences in cognitive reappraisal focuses exclusively on prohedonic emotion goals, such results may reflect not only the effects of regulating emotions using the particular means of cognitive reappraisal, but also the effects of regulating emotions in the pursuit of prohedonic emotion goals.

Other studies examined cognitive reappraisal in experimental studies, in which the temporary use of cognitive reappraisal was manipulated as participants were exposed to emotion-inducing stimuli (e.g., Gross, 1998). Such studies have often compared participants who were instructed to use cognitive reappraisal to participants who were given no instructions (e.g., Gross, 1998; Hajcak & Nieuwenhuis, 2006; Urry, 2010), or to participants who were instructed to respond naturally (e.g., Goldin, Manber-Ball, Werner, Heimberg, & Gross, 2009; McRae et al., 2010; Ochsner, Bunge, Gross, & Gabrieli, 2002). Although other control groups have been used, according to Webb and colleagues (2012), 58% of the studies on cognitive reappraisal that were published by 2010 included such designs. These studies found that compared with participants in the control condition, those who used cognitive reappraisal to decrease their emotional reactions experienced less intense negative emotions. However, if manipulations of cognitive reappraisal activated prohedonic goals, their results may reflect not only the effects of regulating emotions using cognitive reappraisal, but also the effects of activating prohedonic emotion goals.

Some studies have compared a condition in which participants were instructed to decrease their negative emotions using cognitive reappraisal to a condition in which participants were instructed to regulate their emotional expression rather than experience (e.g.,

Gross, 1998; Pedder et al., 2016; Richards & Gross, 2000). Decreasing emotional expression often does not lead to congruent changes in emotional experiences (e.g., Gross, 1998). Thus, these studies do not eliminate the potential confound between prohedonic emotion goals and using cognitive reappraisal, as they compare two conditions that differ in both the means of regulation (i.e., cognitive reappraisal vs. expressive suppression) and the goal of regulation (i.e., decrease experience vs. decrease expression).

Given that emotion goals shape the outcomes of emotion regulation (for a review, see Tamir, 2016), effects of activating emotion goals and effects of using certain means to pursue them may be confounded in at least some of the available studies on cognitive reappraisal. Therefore, we tested whether, at least in some cases, the effects attributed to cognitive reappraisal may result (partially or even fully) from asking people to decrease their negative emotions or increase their positive emotions (i.e., activating prohedonic emotion goals).

### The Current Investigation

The current investigation includes four components. In Part 1, we presented a typical measure of cognitive reappraisal and a classic method used to manipulate it to naïve participants and tested whether they understood them as referring to the use of cognitive reappraisal as means, the pursuit of prohedonic emotion goals, or both. If participants perceive common measures and manipulations as signaling both the implementation of cognitive reappraisal and the activation of prohedonic goals, emotion regulation outcomes could potentially be attributed to the former, to the latter, or to both.

In Parts 2 and 3 of the investigation, we sought to empirically disentangle the effects of goals and means in cognitive reappraisal. In Part 2, we decomposed the common measure of cognitive reappraisal into separate measures targeting either the tendency to pursue prohedonic emotion goals or the tendency to implement cognitive reappraisal. We created new versions of the cognitive reappraisal subscale of the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) that separately assess the frequency of pursuing prohedonic emotion goals or using cognitive reappraisal. We then assessed the extent to which each measure was uniquely associated with the key correlates that were originally reported in Gross and John (2003), including emotional experience, depression, and well-being.

In Part 3, we report two experimental studies, where we separately manipulated the goal of regulation, the means of regulation (i.e., cognitive reappraisal), or both. In Study 3A, we sought to replicate the original design in Gross (1998), adding conditions in which we separately manipulated the goal without the means, as well as the means without the goal. In Study 3B, we sought to extend Study 3A, by targeting a different negative emotion, and by using both self-report and physiological indices to assess the impact on emotional experiences. In that study, we compared the original reappraisal instructions used by Gross (1998) and a control condition to a condition in which we manipulated the goal of regulation, without specifying the means. In both studies, we expected the mere activation of a prohedonic emotion goal to propel emotion regulation in the desired direction, even in the absence of reappraisal instructions. We further expected such

effects to account for at least some of the impact that has previously been attributed to cognitive reappraisal.

Finally, in Part 4 of the investigation, we tested how pervasive the potential confound between goals and means in cognitive reappraisal actually is in the literature. To this end, we conducted a comprehensive literature review to assess whether and to what extent existing research on cognitive reappraisal affords this potential confound.

### Part 1: Assessing Naïve Perceptions of Cognitive Reappraisal Measures and Instructions

When naïve participants complete measures or receive instructions of cognitive reappraisal, do they perceive them as setting a particular emotion goal, directing to the use of a particular means of pursuing emotion goals, or both? We assessed how participants understand common measures and manipulations of cognitive reappraisal, in terms of the goal and the means of regulation.

A common measure of individual differences in cognitive reappraisal is the reappraisal subscale of the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). All but one of the items on this scale (see items 1–6 in Table 1) refer specifically to prohedonic emotion goals. For example, the item “When I want to feel less negative emotion, I change the way I’m thinking about the situation” refers to using cognitive reappraisal (i.e., changing the way I think about the situation), but specifically when pursuing a prohedonic emotion goal (i.e., wanting to feel less negative emotions). Given that 5 of the 6 items in the scale specify prohedonic emotion goals, responses to the scale may not necessarily reflect the frequency of using cognitive reappraisal, in general, but the frequency of using cognitive reappraisal in the service of prohedonic emotion goals, in particular.

A classic manipulation of cognitive reappraisal was developed and tested by Gross (1998). These instructions refer to emotional reactions to a negative film and state: “Please try to think about what you are seeing in such a way that you don’t feel anything at all.” Therefore, they explicitly direct people to use cognitive reappraisal (i.e., think about the film in a different way) to decrease the intensity of their negative emotions (i.e., respond as if you do not feel anything at all). Such instructions, therefore, simultaneously manipulate both the implementation of cognitive reappraisal and the activation of prohedonic goals.

To test naïve perceptions of these measure and manipulation of cognitive reappraisal, we first explained to participants what a goal in emotion regulation refers to and what means in emotion regulation refer to. We then presented them with items on the reappraisal subscale of the ERQ and with the cognitive reappraisal instructions from Gross (1998).<sup>1</sup> Participants indicated with respect to each item whether it specifies an emotion goal (and if so, which one) and whether it refers to the strategy of cognitive reappraisal, in particular.

### Method

**Participants.** All the studies reported in this investigation were approved by the Institutional Review Board at The Hebrew University of Jerusalem. Thirty participants (63% female;  $M_{\text{age}} = 22.77$ ,  $SD = 2.70$ ) participated in return for course credit.

**Procedure.** Participants were presented with a series of items, presented in a random order. Each item included either an item

used to measure cognitive reappraisal or an instruction used to manipulate it (see Table 1). With respect to each item, participants responded to questions about emotion goals in one block and to questions about cognitive reappraisal as means in a separate block, in one of two counterbalanced orders.

When responding to questions about cognitive reappraisal, the experimenter first explained to participants what cognitive reappraisal is. It was presented as a method used to regulate emotions that depend on how people interpret situations. Participants were told that when people use cognitive reappraisal, they try to change how they feel by changing the meaning they assign to the situation that elicits their emotion, so that the new interpretation gives rise to a different emotion. They were further told that there are many ways to change the meaning of a situation. For instance, people can think about the situation from a third-person perspective, imagine themselves in the situation, think how the situation might evolve, or change the explanations for the situation. To ensure that participants understood what reappraisal is, participants were asked to imagine a child crying in the street and think of two ways to change their emotional response using cognitive reappraisal, and one way to change their emotional response that did not involve cognitive reappraisal. Finally, they were asked whether imagining that they are the child that was crying was cognitive reappraisal or not. In all cases, if the participant did not provide the correct answer on the practice items, the explanation was repeated. Participants were told they would read a series of items and indicate whether they convey instructions for (or a measure of) cognitive reappraisal. They then read each target item and indicated whether the item referred to cognitive reappraisal or not (i.e., “Does this item refer to cognitive reappraisal? Select from the following: Yes/No”).

When responding to questions about emotion goals, the experimenter first explained to participants that when trying to regulate emotions, people could try to either increase or decrease their emotional response. Participants were told that sometimes people try to decrease the intensity of their emotions. For example, people often try to decrease their anxiety during exams. They were told that sometimes people try to increase the intensity of their emotions. For instance, people may try to increase their sadness at a funeral. To ensure that participants understood the meaning of the desired direction of emotion regulation, the experimenter then presented participants with two cases (i.e., a car cuts you off on the road; you hear about a child who was abused by her parent), asked whether they would like to regulate their emotions, and if so, in which direction. Participants were asked if they could think of cases in which they would want to regulate their emotions in a different direction than they would in the cases just mentioned. Finally, participants were asked in which direction people try to regulate their emotions when they try to respond as if a situation elicits no emotions at all. If participants answered incorrectly to this question, the explanation was repeated. Participants were told they would read a series of items and indicate whether each item

<sup>1</sup> For exploratory reasons and to create a broader range of items, we included several additional sets of instructions (e.g., distraction instructions from Sheppes et al., 2014; reappraisal instructions from Richards & Gross, 2000). We do not report the findings concerning these instructions, as they were less relevant to the current investigation, but would be happy to share them upon request.

Table 1

*Percentage of Endorsements of References to Cognitive Reappraisal and Specific Emotion Goals (i.e., Up-Regulation, Down-Regulation, Either Up or Down Regulation, or Neither Up nor Down Regulation) in Reference to Common Reappraisal (and Suppression) Manipulations and Measures (Part 1)*

Item	Strategy	Goal			
	Reappraisal	Neither decrease nor increase	Decrease negative	Increase positive	Either increase or decrease
ERQ item 1 When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.	.43	.10	.07	.60	.23
ERQ item 2 When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.	.30	.03	.97	.00	.00
ERQ item 2 When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm.	.97	.03	.87	.03	.07
ERQ item 4 When I want to feel more positive emotion, I change the way I'm thinking about the situation.	.93	.20	.03	.47	.30
ERQ item 5 I control my emotions by changing the way I think about the situation I'm in.	.97	.23	.03	.00	.73
ERQ item 6 When I want to feel less negative emotion, I change the way I'm thinking about the situation.	1.00	.07	.90	.00	.03
Gross (1998)–Reappraisal Please try to adopt a detached and unemotional attitude as you watch the film. In other words, as you watch the film clip, try to think about what you are seeing objectively, in terms of the technical aspects of the events you observe. Watch the film clip carefully, but please try to think about what you are seeing in such a way that you don't feel anything at all.	.73	.17	.80	.03	.00
Gross (1998)–Suppression If you have any feelings as you watch the film clip, please try your best not to let those feelings show. In other words, as you watch the film clip, try to behave in such a way that a person watching you would not know you were feeling anything. Watch the clip carefully, but please try to behave so that someone watching you would not know that you are feeling anything at all.	.10	.47	.43	.00	.10

directs the reader to change their emotion in a specific manner. Participants then read each item and indicated their response (i.e., Does this item direct people to regulate their emotions in a specific direction? Select from the following: Neither decrease nor increase emotion/decrease emotion/increase emotion/either decrease or increase emotion”).

## Results and Discussion

Table 1 presents the mean responses to the questions about cognitive reappraisal and about prohedonic goals, with respect to each item. When reading the items included in the reappraisal subscale of the ERQ (Gross & John, 2003), most participants (97%) understood 4 of the 6 items as referring to the use of cognitive reappraisal. An interesting find was that most participants (64%) did not consider items 1 and 2 in the scale as referring to reappraisal (perhaps because these items can be interpreted as referring to distraction, as they refer to changing what people think about rather than how people think about it). In general, however, participants understood most items as referring to the strategy of cognitive reappraisal. However, in addition to that, most participants (79%) also viewed 5 of the 6 items as referring to prohedonic

emotion goals. Three of the items were understood as referring to decreasing negative emotions, and two items were understood as referring to increasing positive emotions. Therefore, participants understood most items as referring to regulating emotions in a prohedonic direction, in particular.

When reading the reappraisal instructions that were used in Gross (1998), most participants (73%) understood them as instructing to use cognitive reappraisal to regulate emotions. In contrast, when reading the suppression instructions that were used in Gross (1998), most participants (90%) understood them as not instructing to use cognitive reappraisal, demonstrating their ability to discern between instructions that refer to reappraisal and those that do not. However, most participants (80%) also understood the reappraisal instructions as instructing to regulate emotions in a prohedonic direction—namely, to decrease negative emotions. This was not the case with respect to the suppression instructions, where some participants (47%) thought no goal to change emotional experience was activated, whereas others (43%) thought a prohedonic emotion goal was activated. The remaining 10% thought they were asked to either increase or decrease their emotional experiences.

Taken together, these findings demonstrate that when participants read items that are commonly used to measure reappraisal, they perceive them as referring to the frequency of using cognitive reappraisal, but specifically to regulate emotions in a prohedonic direction. Furthermore, when participants receive the instructions that were used to manipulate reappraisal in the laboratory, they interpret these instructions not only as directing them to use cognitive reappraisal, but also to regulate their emotions in a prohedonic direction. This is not necessarily the case for other emotion regulation strategies (e.g., expressive suppression). These results suggest that correlates of the cognitive reappraisal measure and effects of a classical cognitive reappraisal manipulation could potentially be attributed either to the implementation of cognitive reappraisal or to the activation of prohedonic emotion goals. This confound can potentially be resolved by empirically separating the effects of each component, as we sought to do in Parts 2 and 3 of this investigation.

## Part 2: Disentangling Goals From Means When Measuring Cognitive Reappraisal

Part 1 of our investigation suggests that individual differences in cognitive reappraisal, at least as measured by the ERQ, may confound differences in the frequency of using cognitive reappraisal with differences in the frequency of pursuing prohedonic emotion goals. In Part 2 of the investigation, therefore, we sought to assess the separate effects of chronic use of cognitive reappraisal from those of chronic prohedonic emotion goal pursuit. To this end, we developed two new versions of the ERQ scale. One version targeted the frequency of using cognitive reappraisal, without specifying an emotion goal. Another version targeted the frequency of pursuing prohedonic emotion goals, without specifying an emotion regulation strategy. We then tested associations between scores on these different versions of the scale and indices of affective and psychological functioning. Next, we attempted to replicate the findings of Gross and John (2003) on cognitive reappraisal, and assess potentially unique associations of the different versions of the ERQ (i.e., the strategy-focused version, and the goal-focused version) with affective and psychological outcomes. We targeted indices of affective and psychological outcomes (i.e., affective and emotional experiences, well-being and depression), and excluded outcomes that appeared in Gross and John (2003) but were less relevant to the current investigation, such as indices of emotional expression and social functioning.

First, to replicate the original findings in Gross and John (2003), participants in one condition completed the original ERQ scale and the measures of affective and psychological functioning that were included in the original study. Following the original study design, participants in this condition completed only the original scale version, without additional versions. We expected to replicate the original findings. Second, we wanted to test whether the same associations with affective and psychological functioning would be found when using the strategy-focused or goal-focused version. We tested whether the use of the strategy of cognitive reappraisal is the only contributor to differences in affective and psychological functioning, even when controlling for differences in prohedonic goals. To this end, participants in two additional conditions completed both the strategy-focused version and the goal-focused version as well as the measures of affective and psychological

functioning. Having the same participants complete both the strategy-focused and the goal-focused versions of the scale enabled us to assess associations between one scale and the relevant outcomes, while controlling for the other scale.

Given that prohedonic emotion goals are far more common than antihedonic ones (e.g., Gross, Richards, & John, 2006), we expected people who use reappraisal to do so more often in the service of prohedonic goals. Therefore, people who use cognitive reappraisal more often should also be likely to pursue prohedonic goals more often, as would be reflected in a positive correlation between scores on the strategy-focused scale and the goal-focused scale. Nonetheless, we also expected the two scales to be associated with positive psychological outcomes, independent of each other. For instance, we expected people who use cognitive reappraisal more frequently and people who pursue prohedonic emotion goals more frequently to experience more positive and less negative emotions and to report higher psychological well-being.

## Method

**Participants.** Participants were 315 individuals recruited through Amazon's Mechanical Turk (51% female;  $M_{\text{age}} = 33.78$ ,  $SD = 10.95$ ) who received \$1.5 for their participation. Six participants who identified themselves as non-English speakers were omitted from the analysis. In addition, 11 participants who failed one of two attention checks were omitted from the analysis. Finally, following the procedure outlined in Schwartz (1992), we excluded seven participants who had zero variance on the goal-focused scale, which included reverse-scored items.<sup>2</sup>

### Materials.

**Measures of emotion regulation.** Cognitive reappraisal was assessed using the original cognitive reappraisal subscale of the ERQ (Gross & John, 2003). Participants rated the extent to which they agreed (1 = *strongly disagree*, 7 = *strongly agree*) with six items (e.g., "When I want to feel more positive emotion, I change the way I'm thinking about the situation," see Table 2 for the full scale). To create the original index of reappraisal, we averaged across all items ( $\alpha = .93$ ).

In addition, we created two new versions of the scale, to which participants responded using the same response scale. First, to assess the degree to which people use cognitive reappraisal to regulate emotions, independent of the emotion goal they pursue (i.e., strategy-focused scale), we adapted the six items in the original scale, by excluding any references to the desired direction of regulation (e.g., "When I want to influence my emotions, I change the way I'm thinking about the situation," see Table 2 for the complete list of items;  $\alpha = .88$ ).

Second, to assess the degree to which people adopt prohedonic emotion goals when regulating their emotions, independent of the strategy they use to do so (i.e., goal-focused scale), we adapted

<sup>2</sup> Sample size was based on a power analysis of effect sizes reported in Gross and John (2003). Using G\*Power, to find the reported effect for the association between the BDI and ERQ reappraisal with a power of 0.8 we needed a sample size of 143 participants. We had two sub-samples (one with the original ERQ and one with our new modified ERQ versions). We used a slightly larger sample size of ~160 participants for each of our sub-samples, to account for potential 10% exclusions.

Table 2

Items Included in the Original Cognitive Reappraisal ERQ Scale, the New Prohedonic Goal-Focused Scale, and the New Strategy-Focused Scale (Part 2)

Original scale	Prohedonic goal-focused scale	Strategy-focused scale
(1) When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.	(1) When I want to change my feelings, I typically try to feel more positive emotions (such as joy or amusement).	(1) When I want to influence my feelings, I change what I'm thinking about.
(2) When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.	(2) When I want to change my feelings, I typically try to feel less negative emotions (such as sadness or anger).	(2) When I want to impact my emotions, I change what I'm thinking about.
(3) When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm.	(3) When I'm faced with a stressful situation, I typically try to stay calm.	(3) When I'm too stressed or too calm, I make myself think about the situation in a way that helps me feel differently.
(4) When I want to feel more positive emotion, I change the way I'm thinking about the situation.	(4) When I want to influence my emotions, I typically try to feel more positive.	(4) When I want to influence my emotions, I change the way I'm thinking about the situation.
(5) I control my emotions by changing the way I think about the situation I'm in.		(5) I control my emotions by changing the way I think about the situation I'm in.
(6) When I want to feel less negative emotion, I change the way I'm thinking about the situation.	(5) When I want to influence my emotions, I typically try to feel less negative.	(6) When I want to modify my feelings, I change the way I'm thinking about the situation.
	(6) When I want to influence my emotions, I typically try to feel less positive. (reverse scored)	
	(7) When I want to change my feelings, I typically try to feel more negative. (reverse scored)	

Note. ERQ = Emotion Regulation Questionnaire.

five of the original reappraisal items,<sup>3</sup> by excluding any references to cognitive reappraisal (e.g., "When I want to influence my emotions, I typically try to feel less negative," see Table 2 for the complete list of items;  $\alpha = .77$ ). Given the directionality of the items, to increase validity, we added two reverse items ("When I want to influence my emotions, I typically try to feel less positive" and "When I want to change my feelings, I typically try to feel more negative").

**Measures of affective and psychological functioning.** As in Gross and John (2003), we assessed dimensional and discrete emotional experiences, depression, and well-being, using the same measures. To assess affective experiences, participants completed the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) in the "general" format (positive affect:  $\alpha = .92$ ; negative affect:  $\alpha = .90$ ). To assess discrete emotions, participants indicated how much they experienced six positive emotions (e.g., joy, happiness;  $\alpha = .85$ ), and six negative emotions (e.g., sadness, anger;  $\alpha = .81$ ). To assess depressive symptoms, participants completed the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961;  $\alpha = .93$ ), and the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977;  $\alpha = .94$ ). Finally, to assess well-being, participants completed the five-item Satisfaction With Life scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985;  $\alpha = .94$ ), and 18 items developed by Ryff and Keyes (1995) to assess psychological well-being ( $\alpha = .89$ ).

**Additional construct validation items.** As in Gross and John (2003), we included an item that assesses perceived emotion regulation success (i.e., "Overall, how successful would you say you are at altering your emotions?"; 1 = *not at all successful*, 10 = *very successful*). In addition, we measured social desirability with

Strahan and Gerbasi's (1972) short form (10 items) of Crowne and Marlowe's (1960) social desirability questionnaire ( $\alpha = .71$ ).

**Procedure.** Participants were randomly assigned to one of two conditions. In one condition ( $N = 155$ ), participants completed the original ERQ measure and the correlates. In another condition ( $N = 160$ ), participants completed the strategy-focused and the goal-focused versions of the scale and the correlates, in one of two predetermined fixed orders.

## Results

Table 3 presents the correlations of the three scales (i.e., original cognitive reappraisal scale, the revised strategy-focused scale, and the revised prohedonic goal-focused scale) with the psychological outcome indices. As expected, we replicated the original findings of Gross and John (2003), such that the people who used cognitive reappraisal more frequently in pursuit of prohedonic goals (i.e., higher scores on the original reappraisal scale), reported being more successful in emotion regulation, experienced more positive affect and discrete emotions and less negative affect and discrete emotions, were less depressed and more satisfied with their lives, and reported greater psychological well-being.

As expected, the goal-focused and the strategy-focused scales were positively correlated,  $r = .55, p < .001$ . To confirm that our new scales measure distinct constructs, we ran a factor analysis on the items composing the two new scales, restricting the analysis to two components, with a promax (nonorthogonal) rotation. Table 4

<sup>3</sup> One item, "I control my emotions by changing the way I think about the situation I'm in" does not include a regulation direction and, therefore, was replaced in the prohedonic goal-focused scale.

Table 3

*Means, SDs, Raw and Partial Correlations of the Original Reappraisal, Goal-Focused, and Strategy-Focused Scales With Indices of Affective and Psychological Functioning (Part 2)*

Outcome indices	Original reappraisal scale	Goal-focused scale	Goal-focused (partialling out strategy)	Strategy-focused scale	Strategy-focused (partialling out goal)	Mean (SD)
Affective responding						
Positive affect	.34*	.45*	.30*	.44*	.19*	3.03 (.87)
Discrete positive emotions	.47*	.37*	.23*	.37*	.18*	2.42 (.69)
Negative affect	-.31*	-.27*	-.17*	-.27*	-.19*	1.51 (.60)
Discrete negative emotions	-.43*	-.35*	-.20*	-.38*	-.25*	1.50 (.52)
Psychological functioning						
Satisfaction with life	.33*	.20*	.05	.31*	.22*	4.17 (1.68)
Psychological well being	.56*	.51*	.34*	.47*	.27*	4.40 (.85)
Depression (BDI)	-.38*	-.37*	-.18*	-.42*	-.28*	.46 (.48)
Depression (CES-D)	-.49*	-.38*	-.19*	-.42*	-.29*	1.71 (.61)
Other						
Perceived regulation success	.50*	.39*	.11	.58*	.47*	3.35 (.99)
Social desirability	.15#	.11	.01	.22*	.17*	.45 (.24)
Mean (SD)	5.00 (1.28)	5.47 (.88)		5.10 (1.09)		

Note. BDI = Beck Depression Inventory; CES-D = Center for Epidemiological Studies Depression Scale.

\*  $p < .05$ .

presents the complete factor loadings. All the items in the strategy-focused scale had loadings higher than 0.68 on one factor ( $M = 0.76$ ,  $SD = 0.05$ ), and loadings lower than 0.45 on the second factor ( $M = 0.31$ ,  $SD = 0.16$ ). The items in the goal-focused scale had loadings higher than 0.56 on the second factor ( $M = .61$ ,  $SD = 0.09$ ). Five of the seven items in the goal-focused scale had loadings lower than 0.54 on the first factor ( $M = 0.42$ ,  $SD = 0.21$ ). Two of the seven items loaded on both factors, but surprisingly they loaded more heavily on the first ( $M = 0.71$ ) than the second ( $M = 0.51$ ) factor. Although this was unexpected, such a pattern suggests that people who try to feel better use reappraisal more frequently than others.

We also ran a confirmatory analysis. We compared a model, in which items pertaining to the strategy-focused and goal-focused scales comprised two separate factors, to an alternative model, in which all items load on one factor. The two-factor

model had good fit indices, with  $\chi^2(30) = 35.08$ ,  $p = .24$ , normed fit index (NFI) = .97, comparative fit index (CFI) = .97, Tucker Lewis Index (TLI) = .99, and root mean square error of approximation (RMSEA) = .02. The alternative one-factor model also had adequate fit indices, with  $\chi^2(31) = 42.13$ ,  $p = .09$ , NFI = .97, CFI = .99, TLI = .97, and RMSEA = .03. However, as expected, the two-factor model fitted the data significantly better than did the one-factor model,  $\Delta\chi^2(1) = 7.05$ ,  $p < .01$ . Taken together, these findings indicate that the strategy-focused and goal-focused scales measure similar, yet distinct constructs.

We, therefore, proceeded to examine the patterns of associations of each scale with the relevant outcome measures. To assess the potential unique associations of the strategy and the goal with measures of emotional and psychological functioning, we also ran partial correlations, looking at correlations of the goal-focused

Table 4

*Factor Loadings of Items in the Strategy-Focused and Prohedonic Goal-Focused ERQ Scales (Part 2)*

Subscale and item	Component	
	1	2
Strategy-focused scale		
I control my emotions by changing the way I think about the situation I'm in.	.83	.45
When I want to influence my emotions, I change the way I'm thinking about the situation.	.83	.44
When I want to impact my emotions, I change what I'm thinking about.	.75	.18
When I want to modify my feelings, I change the way I'm thinking about the situation.	.79	.45
When I want to influence my feelings, I change what I'm thinking about.	.68	.04
When I'm too stressed or too calm, I make myself think about the situation in a way that helps me feel differently.	.77	.30
Prohedonic goal-focused scale		
When I want to influence my emotions, I typically try to feel less negative.	.27	.54
When I want to influence my emotions, I typically try to feel more positive.	.71	.52
When I want to change my feelings, I typically try to feel more positive emotions (such as joy or amusement).	.70	.50
When I want to change my feelings, I typically try to feel less negative emotions (such as sadness or anger).	.16	.64
When I'm faced with a stressful situation, I typically try to stay calm.	.54	.63
When I want to influence my emotions, I typically try to feel less positive. [reverse scored]	.25	.76
When I want to change my feelings, I typically try to feel more negative. [reverse scored]	.33	.71

Note. ERQ = Emotion Regulation Questionnaire.

scale, controlling for the strategy-focused scale, and vice versa. Table 3 presents these raw and partial correlations.

To assess the potential unique contributions of the goal-focused and strategy-focused scales in predicting affective and psychological functioning, we ran a series of regressions, in which we predicted each index, using the goal-focused scale, strategy-focused scale, gender (0 = male, 1 = female) and order of scale administration (0 = strategy-focused first, 1 = goal-focused first) as simultaneous predictors, and the interaction terms of each scale with order. Table 5 presents the regression coefficients of the goal-focused and strategy-focused scales. As shown in the table, both the goal-focused scale and the strategy-focused scale were independent significant predictors of positive affect and discrete positive emotions, psychological well-being, and depression. Gender was not a significant predictor in any of these analyses,  $t_s < 1.30$ . Order of administration was not a significant predictor in any of the analyses,  $t_s < 1.70$ . Finally, none of the effects of the goal-focused or strategy-focused scales were moderated by order, as indicated in nonsignificant interactions between order and each of the two scales,  $t_s < 1.70$ .<sup>4</sup>

## Discussion

Taken together, these analyses suggest that participants who adopted prohedonic emotion goals more frequently when regulating their emotions, regardless of the specific strategy they used to pursue them, experienced more positive and less negative affect, more positive and less negative discrete emotions, less depression, and greater psychological well-being. As expected, pursuing prohedonic emotion goals was unrelated to the efficacy of emotion regulation. These findings suggest that both the pursuit of prohedonic emotion goals and the use of cognitive reappraisal may independently contribute to the positive associations of the original cognitive reappraisal scale with affective and psychological functioning. In Part 3 of the investigation, we empirically tested this causal account.

### Part 3: Assessing Causal Effects of Prohedonic Goals and Means in Cognitive Reappraisal

The findings in Part 2 suggest that both the frequency of pursuing prohedonic emotion goals and the frequency of using cognitive reappraisal as means are independently linked to positive emotional and psychological outcomes, and may account for some of the variance attributed to cognitive reappraisal. These measures of individual differences, however, do not fully distinguish between goals and means, as people report on using reappraisal as they pursue frequent (and, therefore, likely prohedonic) emotion goals. Furthermore, the findings in Part 2 are correlational and cannot be used to infer causality. Therefore, Part 3 of this investigation was designed to assess the unique contributions of activating prohedonic goals and of implementing cognitive reappraisal to emotional outcomes. To do so, we conducted two experimental studies. Study 3A was designed to replicate the study that introduced a classic method for experimentally manipulating reappraisal in the laboratory (Gross, 1998), using instructions designed to uniquely manipulate either the activation of prohedonic goals or the implementation of cognitive reappraisal. Study 3B was designed to replicate and extend Study 3A, using both self-report and psychophysiological measures to assess emotional outcomes.

## Study 3A

In Gross (1998), participants were either instructed to respond naturally to a negative film or to use cognitive reappraisal to decrease their responses to the film. Our main goal in Study 3A was to replicate this study and compare the original reappraisal instructions to manipulations that target either cognitive reappraisal, the activation of prohedonic emotion goals, or both. Therefore, Study 3A included a condition with the original manipulation of cognitive reappraisal, in which participants were instructed to use cognitive reappraisal to decrease their emotional response to the negative film. The study also include the original control condition, in which participants were asked to respond naturally to the negative film.

To test our key hypothesis, we added a new goal-focused condition, in which we instructed participants to decrease the intensity of their emotions to the film, without any reference to cognitive reappraisal as the potential means with which to do so. We hypothesized that the effective decrease in negative emotions that was reported in Gross (1998) may have been due, in part, to the activation of prohedonic goals, embedded within the initial reappraisal instructions. Therefore, we predicted that participants who were instructed to decrease their emotional reactions would be effective in doing so (i.e., feel less negative emotions), even without instructions to reappraise.

To induce negative emotions, participants in Gross (1998) watched intense disgust-inducing films (e.g., arm amputation). Because these films present negative visceral content, stripped of social context, we expected such stimuli to reinforce prohedonic emotion goals. Outside the laboratory, however, emotional stimuli are often more complex, resulting in substantial variation in emotion goals (e.g., Porat, Halperin, & Tamir, 2016). To afford greater variance in emotion goals, participants in Study 3A watched sadness-inducing film clips that feature personal stories from the Jewish holocaust. Such clips present negative content that is linked to a meaningful social context. Given that people vary in their motivation to regulate group-based sadness (Porat, Halperin, Mannheim, & Tamir, 2016), we expected this stimulus to yield variation in the direction in which our participants choose to regulate their emotions.

If participants have accessible emotion regulation means, but prohedonic emotion goals are not constantly active, activating such goals by instructing them to decrease their negative emotions may lead to significant decreases in such emotions. Activating a prohedonic emotion goal by instructing people to decrease their negative emotions may trigger cognitive reappraisal or other accessible emotion regulation strategies. However, it is less likely to trigger cognitive reappraisal, compared with explicit instructions to use cognitive reappraisal. Therefore, in the present context, we expected participants who were instructed to decrease their negative emotions (without specifying means) to be effective in doing so, even though they are less likely to use cognitive reappraisal.

Alternatively, if participants have active prohedonic emotion goals, but no accessible emotion regulation means, providing them with effective regulation means should lead to significant de-

<sup>4</sup> Our analyses in Part 2 of the investigation suggested that items 1 and 2 in the original reappraisal scale might lack face validity. When we repeated our key analyses without those two items, results remained largely unchanged.

Table 5  
*Regression Coefficients of Goal-Focused and Strategy-Focused Scales, When They are Included as Simultaneous Predictors of Affective and Psychological Indices, Along With Gender and Order of Administration (Part 2)*

Outcome indices	Goal-focused scale		Strategy-focused scale	
	Standardized $\beta$	$t$ ( $p$ -value)	Standardized $\beta$	$t$ ( $p$ -value)
Affective responding				
Positive affect	.29	2.41 (.017)	.29	2.22 (.028)
Discrete positive emotions	.33	2.65 (.009)	.28	2.09 (.039)
Negative affect	-.25	-1.95 (.054)	-.10	-.70 (.484)
Discrete negative emotions	-.33	-2.64 (.009)	-.19	-1.40 (.163)
Psychological functioning				
Satisfaction with life	.01	.06 (.952)	.43	3.09 (.003)
Psychological well being	.34	3.02 (.003)	.42	3.15 (.002)
Depression (BDI)	-.25	-2.04 (.043)	-.33	-2.42 (.017)
Depression (CES-D)	-.35	-2.88 (.005)	-.23	-1.74 (.084)
Other				
Perceived regulation success	.19	1.69 (.093)	.47	3.85 (<.001)
Social desirability	.05	.33 (.742)	.23	1.53 (.129)

Note. BDI = Beck Depression Inventory; CES-D = Center for Epidemiological Studies Depression Scale.

creases in negative emotions, even when participants are not explicitly instructed to decrease their negative emotions. To test this possibility, we added a new strategy-focused condition, in which we instructed participants to use cognitive reappraisal to regulate their emotions, without specifying an emotion goal. Using cognitive reappraisal may trigger prohedonic emotion goals, but not in every individual nor in every context, and specifically not in response to the film we selected. Therefore, we did not expect participants who were instructed to use cognitive reappraisal without specifying a prohedonic emotion goal to decrease their negative emotions.

#### Method.

**Participants.** We recruited 133<sup>5</sup> Jewish Israeli undergraduate students ( $M_{\text{age}} = 24.53$  years, 55% female) from academic institutions in Israel to participate in return for course credits or monetary compensation (approximately \$12). Three of these participants failed to follow instructions (i.e., explicitly stated that they did not try to regulate or decrease their emotions at all, although they were instructed to do so) and were omitted from the analyses.

#### Materials.

**Emotion-inducing films.** Participants watched one neutral and two sadness-inducing film clips. The neutral film (60 s) was identical to that used by Gross (1998), depicting a dynamic display of colorful abstract shapes. The first sad film (93 s) was taken from the movie *Escape from Sobibor* and depicted a Nazi officer beating to death a Jewish prisoner. The second sad film (123 s) was taken from the movie *Sophie's Choice* and depicted a mother who is forced by a Nazi officer to choose which of her two children would live and who would die. A pilot test ( $N = 30$ ) confirmed that the two sad films induced relatively intense sadness ( $M_s = 6.17$  and  $7.43$ , for the first and second sad films, respectively). The films also induced more intense sadness than fear ( $M_s = 3.87$  and  $5.03$ ), indifference ( $M_s = 1.70$  and  $1.60$ ), or happiness ( $M_s = 1.20$  and  $1.07$ ).

**Emotion rating form.** Following Gross (1998), participants rated how they felt after viewing each film. On each occasion,

participants rated their sadness, which was embedded in a set of 15 distractor items (amusement, anger, arousal, confusion, contempt, contentment, embarrassment, fear, happiness, interest, pain, relief, disgust, surprise, and tension). Each emotion was rated using a 9-point Likert-type scale, ranging from 0 (*not at all*) to 8 (*to a large extent*).

**Reported emotion regulation.** To understand how participants regulated their emotions, they responded to a series of questions about their regulatory attempts. All responses were made on a 0 (*not at all*) to 8 (*to a large extent*) scale. Participants rated the extent to which they tried to control their emotions. They rated the extent to which they tried to decrease their negative emotions and the extent to which they tried to maintain or increase their negative emotions. Finally, to assess the actual use of cognitive reappraisal, participants rated the extent to which they tried to think about the situation as if they or someone close to them were experiencing it, and the extent to which they tried to think about the situation from a stranger's perspective.

**Procedure.** The initial procedure closely followed that of Gross (1998). After they provided demographic information participants watched a blank computer screen for 1 min and were asked to clear their mind of all thoughts, feelings, and memories. Next, participants were told they would watch a short film clip and that they should say "stop" if they find it too distressing. The experimenter sat in a separate room and observed the participants through a camera. Participants watched the neutral film and completed the emotion rating form. Then participants watched a blank computer screen for 1 min. Next, all participants watched the first sad film (i.e., *Escape from Sobibor*) and completed the emotion rating form. Participants were then randomly assigned to one of four experimental conditions (see Table 6 for the complete list of

<sup>5</sup> We set our sample size to 30 participants per cell (plus 10% to account for possible attrition), which has been recommended as the minimum requirement for detecting medium effect sizes at .80 power (Voorhis & Morgan, 2007).

Table 6  
 Experimental Instructions by Condition (Studies 3A and 3B)

Experimental condition	Instructions
Watch	Please watch the screen carefully.
Decrease + Reappraise (Gross, 1998)	Please try to adopt a detached and unemotional attitude as you watch the film. In other words, as you watch the film, try to think about what you are seeing objectively, in terms of the technical aspects of the events you observe. Watch the film clip carefully, but please try to think about what you are seeing in such a way that you don't feel anything at all.
Decrease only	As you watch the film please try to decrease your emotional reactions as much as possible. In other words, try to influence your emotions in a manner that will decrease your emotional reaction to the film.
Reappraise only	Please try to regulate your emotions—that is maintain, decrease or increase your emotional response as you watch the film. To do so, as you watch the film clip, try to change the meaning you assign to the situation. You can imagine yourself or someone close to you in the situation, or you can think about the situation from an objective, third person perspective.

conditions and the instructions given in each). The first and second conditions were identical to the watch and the reappraisal conditions in Gross (1998), respectively. Participants assigned to the first condition (i.e., “watch”) were asked to watch the film carefully. Participants assigned to the second condition (i.e., “decrease + reappraise”) were given the same reappraisal instructions as in Gross (1998). Participants in the third condition (i.e., “decrease only”) were asked to decrease their emotional reactions, without specifying the means of regulation. Participants in the fourth condition (i.e., “reappraise only”) were asked to reappraise their emotional reactions, using reappraisal instructions that were adapted from Gross (1998) and Ochsner and colleagues (2004), without specifying the direction of regulation. All participants watched the second sad film (i.e., *Sophie's Choice*) and completed the emotion rating form. Finally, participants answered questions about the ways in which they regulated their emotions while watching the second film (see “reported emotion regulation” above).

### Results.

**Sadness experience.** First, to test our predictions, we followed the analyses conducted by Gross (1998). We computed a change score by subtracting the experience of sadness in response to the neutral film from the experience of sadness in response to the second sad film. We then ran a one-way analysis of variance (ANOVA), predicting this change score from experimental conditions. The omnibus test was significant,  $F(3, 126) = 4.20, p = .007$ . Figure 1 presents the mean sadness change scores by experimental condition. Tests of planned contrasts confirmed our hypotheses, that there were no significant differences between participants in the decrease + reappraise condition ( $M = 5.23, SD = 2.46$ ) and those in the “decrease only” condition ( $M = 4.79, SD = 2.91$ ),  $t < 1$ . Participants in both of these conditions showed smaller increases in sadness than did participants in the “watch” condition ( $M = 6.51, SD = 2.28$ ) and those in the “reappraise only” condition ( $M = 6.47, SD = 2.54$ ),  $t(126) > 1.98, ps < .050$ . There was no significant difference between the watch condition and the reappraise only condition,  $t < 1$ . Given our sample size, we had a power of .80 to detect a moderate effect size (Cohen's  $d = 0.62$ ), such that if the effect size in the population is at least a Cohen's  $d$  of 0.62, we had a .80 likelihood of detecting it. Therefore, the failure to reject the null hypothesis suggests that this effect, even if it exists in the population, is smaller than a Cohen's  $d$  of 0.62.

As another test of our prediction, we ran a repeated-measures analysis with Condition (watch, decrease + reappraise, decrease only, or reappraise only) as a between-participants variable, and Film (neutral, 1st sad, 2nd sad) as a within-participant variable. As expected, we found a main effect for film,  $F(2, 252) = 545.71, p < .001, \eta^2 = .81$ , such that participants felt sadder following the first ( $M = 6.14, SD = .19$ ), and second ( $M = 6.48, SD = .17$ ) sad films, compared with the neutral film ( $M = .65, SD = .12$ ). We also found a significant Film  $\times$  Condition interaction,  $F(6, 252) = 2.72, p = .037, \eta^2 = .051$ . As expected, there were no significant differences among participants in their responses to the neutral film or in their responses to the first sad film,  $F < 1.60$ , pointing to potential equivalence across conditions in sadness at baseline and in sadness reactivity, before the critical manipulation. However, there was a significant difference across conditions in response to the second sad film,  $F(3, 126) = 3.28, p = .023, \eta^2 = .07$ . As predicted, there were no significant differences between participants in the decrease only condition and those in the decrease + reappraise condition,  $t < 1$ . Participants in the decrease only condition felt significantly less sad in response to the second sad film ( $M = 5.88, SD = .32$ ) than did participants in the watch condition ( $M = 6.89, SD = .32$ ),  $p = .029$ . Participants in the decrease + reappraise condition felt marginally less sad than those

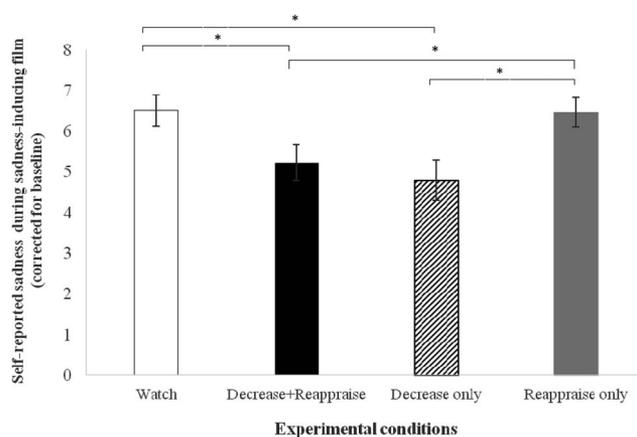


Figure 1. Self-reported sadness during the sadness-inducing film (corrected for baseline), as a function of experimental condition (Study 3A).

in the watch condition,  $p = .079$ . There were no significant differences between participants in the reappraise only condition ( $M = 7.10, SD = .34$ ) and those in the watch condition,  $t < 1$ , but participants in the reappraise only condition were significantly sadder than were participants in both the decrease only and decrease + reappraise conditions,  $ps < .04$ .

Our instructions either activated a prohedonic goal (in the decrease only and decrease + reappraise conditions) or not (in the watch and reappraise only conditions), and either instructed the use of reappraisal as means (in the decrease + reappraise and reappraise only conditions) or not (in the watch and decrease only conditions). Therefore, we could also submit our data to a test of a 2(goal activation)  $\times$  2(reappraisal instructions) factorial design. When predicting mean sadness change scores, we found a significant effect for goal activation,  $F(1, 126) = 11.84, p = .001, \eta^2 = .086$ , such that activating a prohedonic goal resulted in less of an increase in negative emotions ( $M = 5.01, SE = .30$ ) than when a prohedonic goal was not activated ( $M = 6.49, SE = .30$ ). No other effect was significant,  $F_s < 1$ .

**Emotion regulation.** To examine whether our experimental manipulation influenced reports of emotion regulation, we ran a series of one-way ANOVAs, predicting responses on each emotion regulation question from experimental condition. Conditions differed significantly on all but one emotion regulation question,  $F_s(3, 126) > 3.21, p < .025$ . The results of all pairwise comparisons and the tests of planned contrasts are provided in Table 7.

First, as expected, participants in the decrease + reappraise ( $M = 4.90, SD = 1.99$ ) and decrease only ( $M = 5.12, SD = 1.90$ ) conditions tried to control their emotions more than did participants in the watch condition ( $M = 3.31, SD = 2.37$ ). Participants in the reappraise only condition ( $M = 4.27, SD = 2.24$ ) tried to control their emotions marginally more than participants in the watch condition did. Second, as predicted, there were no significant differences between participants in the decrease only condition ( $M = 4.85, SD = 1.92$ ) and those in the decrease + reappraise ( $M = 5.06, SD = 2.13$ ) conditions in their motivation to decrease their negative emotions. However, these participants tried harder to decrease their negative emotions than did participants in the watch ( $M = 3.03, SD = 2.64$ ) and reappraise only ( $M = 2.67, SD = 2.51$ ) conditions. There were no significant differences between the latter two conditions. Third, participants in the reappraise only condition ( $M = 3.70, SD = 2.56$ ) were more motivated to try to maintain or increase their negative emotions, compared with participants in the watch ( $M = 1.77, SD = 2.04$ ), decrease only ( $M = 1.91, SD = 1.56$ ), and decrease + reappraise ( $M = 2.13, SD = 1.98$ ) conditions. There were no significant differences between the latter three conditions. Finally, participants in the reappraise only condition ( $M = 4.33, SD = 2.82$ ) tried harder to think about the situation as if they or a close other were in it than did participants in the watch condition ( $M = 2.60, SD = 2.72$ ), the decrease only condition ( $M = 2.47, SD = 2.45$ ), and marginally harder than participants in the decrease + reappraise condition ( $M = 3.03, SD = 2.63$ ),  $t(126) = 1.93, p = .058$ . There were no significant differences among participants in the extent to which they tried to think about the event from a stranger's perspective,  $F < 1.10$ .

**Discussion.** The findings of Study 3A suggest that, at least in some contexts, activating an emotion goal may bring about desired changes in emotional experience. Even when participants were not

Table 7  
Results of Planned Pairwise Comparisons, Testing Differences Between Conditions on Responses to Emotion Regulation Questions (Study 3A)

Emotion regulation question	Pairwise comparison			
	Watch vs. Decrease + Reappraise	Watch vs. decrease only	Watch vs. reappraise only	Decrease + Reappraise vs. reappraise only
"I tried to influence my feelings"	-3.01 (.003)	-3.50 (.001)	-1.79 (.076)	-1.16 (.247)
"I tried to decrease my negative feelings"	-3.58 (<.001)	-3.29 (.001)	.63 (.529)	4.06 (<.001)
"I tried to maintain or increase my negative feelings"	-.71 (.481)	-.28 (.777)	-3.78 (<.001)	-2.99 (.003)
"I tried to imagine myself or someone close in the situation"	-.66 (.510)	-.20 (.840)	-2.62 (.010)	-1.91 (.058)
"I tried to think about the situation as a stranger"	-1.39 (.168)	-1.41 (.162)	-.32 (.746)	1.02 (.310)
				decrease only vs. reappraise only
				1.59 (.114)
				3.79 (<.001)
				-3.48 (.001)
				-2.80 (.006)
				1.03 (.305)

Note. Numbers in cells are values of  $t$ -statistics ( $df = 126$ ) and numbers in parentheses are  $p$  values.

provided with specific means with which to pursue their desired emotions, participants who were instructed to decrease their emotions were effective in doing so. In fact, these participants were no less effective than participants who were instructed to decrease their emotions using cognitive reappraisal. This is likely because the activation of a goal triggers a range of associated means (see Kruglanski et al., 2012). In the present context, the activation of a prohedonic emotion goal likely activated not only cognitive reappraisal, but other potential regulation strategies.

In addition, reappraisal instructions were effective in decreasing sadness, only when they were accompanied by instructions to decrease negative emotions. The instructions to use cognitive reappraisal likely activated prohedonic emotion goals in some, but not all, of our participants. At least some of our participants were not necessarily motivated to decrease their reactions to a film that reflected moral injustice connected to their heritage. Participants who were given reappraisal instructions, without specifying an emotion goal, were motivated to use reappraisal to decrease, maintain, or even increase their sadness, leading them to feel as sad, on average, as did participants who were not instructed to regulate their emotions at all. This finding further highlights the importance of distinguishing between effects of goals and means in emotion regulation.

Because we followed the methods used in Gross (1998), we measured emotional experience using self-report. It is possible that some of our findings reflect the effects of demand characteristics. Such characteristics might explain the differences between the decrease only and the watch conditions or the differences between the decrease + reappraise and the watch conditions. Demand characteristics, however, cannot explain why we found no significant differences between the reappraise only and the watch conditions, nor why we found no differences between the decrease only and the decrease + reappraise conditions. Nonetheless, we conducted Study 3B to further compare the effects of reappraisal instructions and the potential effects of activating prohedonic emotion goals, using a different emotion-inducing stimulus and using additional measures to assess emotional experiences that are less subject to experimenter demand.

### Study 3B

In Study 3B, we sought to replicate the key findings of Study 3A and compare reappraisal instructions that simultaneously manipulate cognitive reappraisal and prohedonic emotion goals, with instructions that manipulate only prohedonic emotion goals. Therefore, Study 3B included three experimental conditions: a control condition (i.e., watch), a condition including the classic manipulation of cognitive reappraisal (i.e., decrease + reappraise), and a condition in which we manipulated prohedonic emotion goals, without specifying the means of regulation (i.e., decrease only).

To further establish the validity of our findings in Study 3A, we included more reliable measures of emotional experience. First, we used a self-report assessment of emotional experience that included multiple items. Second, to establish validity, we included psychophysiological indices of emotional experiences. In particular, we assessed the valence of emotional experiences using facial electromyography (EMG). The activation of the Corrugator supercilii muscle (that draws the eyebrow downward and medially,

creating a frown) and the activation of the zygomaticus major muscle (that draws the angle of the mouth superiorly and posteriorly, creating a smile) have been consistently linked to more intense negative and positive affect, respectively (e.g., Bradley, Codispoti, Cuthbert, & Lang, 2001; Cacioppo, Berntson, Klein, & Poehlmann, 1997; Mauss & Robinson, 2009). Activation of the corrugator muscle has also been linked to anger, in particular (e.g., Dimberg & Petterson, 2000).

To establish the generalizability of our findings, in Study 3B, we targeted a different negative emotion. Participants watched an anger-inducing film, depicting an Arab member of the Israeli parliament who is presumably speaking in support of Palestinian acts of terror against Israeli citizens. Before watching the film, participants were assigned to one of the three experimental manipulations. In the control condition (watch), participants were instructed to watch the film and respond naturally. In the classic reappraisal condition (decrease + reappraise), participants were instructed to decrease their emotional reactions to the film using cognitive reappraisal. In the goal-focused condition (decrease only), participants were instructed to decrease their emotional reactions to the film, without specifying the means with which to do so. We assessed self-reported emotional experience before and after watching the film and we assessed the activation of the corrugator and zygomatic muscles throughout the study. Finally, to examine whether participants in the decrease condition spontaneously used cognitive reappraisal to the same extent as did participants in the decrease + reappraise condition, we assessed the extent to which participants used cognitive reappraisal as well as other regulation strategies (i.e., distraction) to regulate their emotions in response to the film. To assess the use of cognitive reappraisal, we included items that describe reappraisal more generally, rather than strategy-specific items as we did in Study 3A, to ensure that we capture diverse instances of reappraisal.

#### Methods.

**Participants.** Participants were 138<sup>6</sup> Jewish Israeli undergraduate female students ( $M_{\text{age}} = 23.11$ ,  $SD = 1.92$ ). Participants received ~\$20 as compensation for their participation. One participant was excluded from the analyses because she was not a native Hebrew speaker and expressed comprehension problems, and another participant was excluded because during debriefing she expressed confusion about the use of the rating scales.

#### Materials.

**Emotion-inducing films.** We used a neutral and an anger-inducing film clip. The neutral film (341 s) was identical to the one used by Gross (1998), depicting a dynamic abstract display. The anger-inducing film (233 s) included six introductory power point slides and a film on the Arab minority in Israel. The introductory slides included basic information about the Arab minority (i.e., the size of the population, their civil rights, and their representation in the Israeli parliament) and introduced the issue that lies at the center of the film—namely, whether members of the Arab minority are loyal to Israel or to the Palestinian people. The film itself depicted an Arab parliament member, speaking in favor of the

<sup>6</sup> To ensure sufficient power in Study 3B, rather than follow general recommendations as we did in Study 3A, we determined our sample size following an a priori power analysis, based on detecting a medium effect size with .80 power, which resulted in a larger sample size.

fight of Palestinians for freedom, while Jewish victims of terror attacks were displayed in the background. A pilot test ( $N = 18$ ) confirmed that the film induces relatively intense levels of anger in Jewish Israeli participants ( $M = 7.25$ ,  $SD = 1.55$ , where 1 = *not at all*, 9 = *very much*).

**Self-reported anger experience.** To assess the experience of anger, participants rated (0 = *not at all*, 8 = *extremely*) the extent to which they felt anger, rage, contempt, irritation, and hatred. These anger items were interspersed with other emotion items (i.e., relaxation, fear, happiness, anxiety, sadness, love, disgust, and calmness). Participants rated their experience of anger after watching the neutral film ( $\alpha = .77$ ) and after watching the anger-inducing film ( $\alpha = .90$ ).

**Electromyography.** EMG signals over the corrugator supercilli and the zygomatic major muscle groups were recorded using MindWare Technologies (Gahanna, OH) and BioLab Acquisition software (Version 3.0, MindWare Technologies). Five cup-style Ag–AgCl facial electrodes (two measuring corrugator supercilli, two measuring zygomatic major, and one ground electrode) were filled with saline conductive gel and attached to the participant using 4-mm adhesive disks. EMG signals were sampled continuously at 1,000 Hz. Incoming signals were inspected visually and compared with a video feed of the participant's head and chest. Offline, data were subjected to a 50–200 Hz Band Pass filter to exclude movement and eyeblink artifact and were fully rectified using MindWare EMG 3.0.15 biosignal processing software. EMG responses to the anger-inducing film were averaged per condition. Change scores were calculated separately for corrugator and for zygomatic activity by subtracting the mean activity during the 2 s preceding film onset (baseline) from the average response during the film viewing interval (e.g., Lang, Greenwald, Bradley, & Hamm, 1993; Winkelman & Cacioppo, 2001). Data from all participants were included in the analysis. Only one participant had mean EMG scores that were more than 3  $SD$ s from the sample mean. To remain conservative, we kept this participant in the analysis, although results remain unchanged when this participant was excluded. To further control for the potential confounding nature of baseline physiological responding (e.g., Mendes, Blascovich, Lickel, & Hunter, 2002), we computed standardized residuals in a regression with baseline EMG scores as the predictor variable and the difference score between EMG during the anger-inducing film and EMG at baseline as the criterion variable (Shallcross, Ford, Floerke, & Mauss, 2013; Waugh, Panage, Mendes, & Gotlib, 2010). This residual was then used as the criterion variable in subsequent analyses.

**Emotion regulation questions.** Two types of indices were included to assess whether and how participants regulated their emotions. First, participants in all three conditions were asked to describe, in their own words, what they said to themselves during the film to influence their emotions, to the extent that they tried to influence their emotions. Second, participants responded to a series of closed-ended questions about their regulatory efforts during the anger-inducing film. All responses were made on a 1 (*not at all*) to 6 (*a lot*) scale. Participants were asked to what extent they tried to control their emotions, to what extent they tried to decrease their negative feelings, how hard they tried to regulate their feelings, and how successful they felt they were. To assess the extent to which participants used distraction, participants rated the extent to which they tried to think about something else while watching

the film. To assess the extent to which participants used cognitive reappraisal, participants rated the extent to which they tried to change what the film meant to them, the extent to which they tried to give the information that was presented a new meaning, and the extent to which they tried to think about the content of the film in a more positive manner ( $\alpha = .68$ ).

**Procedure.** The study was presented to participants as examining individual differences in responses to films. Participants underwent the application of electrodes for the recording of corrugator and zygomatic EMG. Participants were seated approximately 40 in. (101 cm) from a computer monitor that displayed the film clips. A small table was located so that participants' right hand rested on a keyboard on which they responded to questions. Participants were filmed throughout the session. After the electrodes were attached and the correct placement was confirmed, participants watched a neutral film and rated their emotional responses to it. Participants were then assigned to either a watch, decrease + reappraise, or decrease only conditions and received the same instructions as did participants in Study 3A, who were assigned to the same conditions (see Table 6). Participants then watched the anger-inducing film. When the film ended, participants watched a black screen for 10 s, and then rated their emotional reactions to the film and responded to the emotion regulation questions.

## Results

**Anger experience.** To test the effects of decrease + reappraise and decrease only instructions on experienced anger, we ran two types of analyses. First, we ran a repeated-measures ANOVA, in which we predicted anger experience, with Condition (watch, decrease only, and decrease + reappraise) as a between-subjects variable, and Film (baseline vs. anger-inducing film) as a within-subject variable. As expected, we found a significant effect for Film,  $F(1, 132) = 464.55$ ,  $p < .001$ ,  $\eta_p^2 = .78$ , such that anger was significantly more intense after the anger-inducing film ( $M = 4.90$ ,  $SD = .17$ ) compared with baseline ( $M = 1.00$ ,  $SD = .10$ ). More importantly and consistent with our prediction, we found a significant Film  $\times$  Condition interaction,  $F(2, 132) = 3.56$ ,  $p = .031$ ,  $\eta_p^2 = .05$ . Planned pairwise comparisons confirmed that while conditions did not vary at baseline,  $F < 1$ , they did vary in anger experience in response to the anger-inducing film,  $F(2, 132) = 4.26$ ,  $p = .016$ ,  $\eta_p^2 = .06$ . Participants in both the decrease + reappraise ( $M = 4.45$ ,  $SD = 1.99$ ) and the decrease only ( $M = 4.64$ ,  $SD = 2.17$ ) conditions felt less angry than did those in the watch condition ( $M = 5.60$ ,  $SD = 1.83$ ),  $p$ s  $< .025$ , and were not significantly different from each other,  $p = .648$ .

Second, to further control for the potential confounding nature of baseline anger and to correspond to subsequent analyses with physiological data, we also computed a difference score by subtracting the average ratings of anger items in response to the neutral film from the average ratings of anger items in response to the anger-inducing film, and computed standardized residuals from a regression with baseline anger as the predictor variable and the difference score between anger in response to the anger-inducing film and anger during baseline as the criterion variable (Shallcross et al., 2013; Waugh et al., 2010). We then conducted a one-way ANOVA, predicting residual anger change scores from Condition (watch, decrease only, and decrease + reappraise). As expected,

we found a main effect for Condition,  $F(2, 134) = 4.32, p = .015$ . There were no significant differences between participants in the decrease only condition and those in the decrease + reappraise condition,  $t < 1$ . Replicating prior research, participants in the decrease + reappraise condition ( $M = -.47, SD = 2.07$ ) showed a smaller increase in anger compared with participants in the watch condition ( $M = .68, SD = 1.74$ ),  $t(132) = 2.78, p = .006$ . However, participants in the decrease only condition ( $M = -.22, SD = 2.04$ ) similarly showed a smaller increase in anger compared with participants in the watch condition,  $t(132) = 2.21, p = .029$ . For ease of interpretation, Figure 2 presents nonresidual change scores, as a function of condition. Given our sample size, we had a power of .80 to detect a moderate effect size (Cohen's  $d = 0.53$ ), such that if the effect size in the population is at least a Cohen's  $d$  of 0.53, we had a .80 likelihood of detecting it. Therefore, the failure to reject the null hypothesis suggests that this effect, even if it exists in the population, is smaller than a Cohen's  $d$  of 0.53.

**Electromyography.** To test the effects of our different manipulations on corrugator activity, we ran a one-way ANOVA, predicting residual corrugator change scores from condition. We found a main effect for Condition,  $F(2, 134) = 3.68, p = .028$ . As expected, there were no significant differences between participants in the decrease only condition and participants in the decrease + reappraise condition,  $t < 1$ . Replicating prior research, participants in the decrease + reappraise condition ( $M = -.34, SD = 2.70$ ) showed a significantly smaller increase in corrugator activity from baseline than did participants in the watch condition ( $M = .83, SD = 2.37$ ),  $t(132) = 2.17, p = .032$ . Similarly, participants in the decrease only condition ( $M = -.50, SD = 2.57$ ) showed a significantly smaller increase in corrugator activity from baseline than did participants in the watch condition,  $t(132) = 2.50, p = .014$ . For ease of interpretation, Figure 3 presents nonresidual change scores, as a function of condition. To test whether the effects of our manipulation on facial muscle activity were specific to the corrugator muscle group, we repeated the analyses above, predicting activity in the zygomatic muscles. We

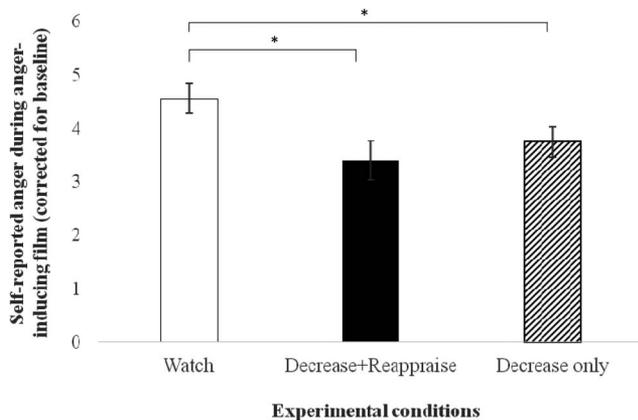


Figure 2. Self-reported anger during an anger-inducing film (corrected for baseline), as a function of experimental conditions (Study 3B).

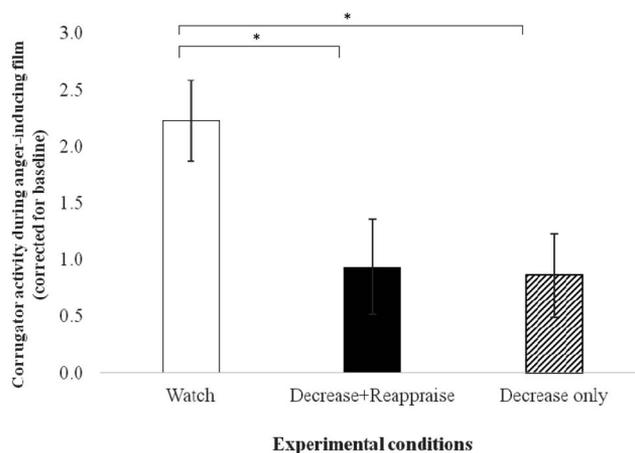


Figure 3. Corrugator activity during an anger-inducing film (corrected for baseline), as a function of experimental conditions (Study 3B).

found no differences between conditions,  $t(132) < 1.38, ps > .171$ .

#### Emotion regulation.

**Closed-ended responses.** As expected, one-way ANOVAs confirmed that conditions differed in the extent to which participants tried to regulate their negative emotions, how much effort they exerted in such attempts, the extent to which they tried to decrease their negative emotions, the extent to which they used reappraisal, and the extent to which they used distraction,  $F_s > 6.05, ps < .003$ . First, as expected, participants in the decrease only condition tried to regulate their emotions ( $M = 5.00, SD = .76$ ) equally hard as did participants in the decrease + reappraise condition ( $M = 5.07, SD = .76$ ),  $t < 1$ . Participants in both the decrease only and decrease + reappraise condition tried to regulate their emotions more than did participants in the watch condition ( $M = 2.54, SD = 1.28$ ),  $t_s(133) > 12.19, ps < .001$ . Similarly, participants in the decrease only condition reported exerting as much effort ( $M = 4.59, SD = 1.09$ ) as did participants in the decrease + reappraise condition ( $M = 4.68, SD = .83$ ),  $t < 1$ . Participants in both the decrease only and decrease + reappraise condition exerted more effort to regulate their emotions than did participants in the watch condition ( $M = 2.35, SD = 1.27$ ),  $t_s(133) > 9.94, ps < .001$ .

Second, as expected, participants in the decrease only condition ( $M = 4.76, SD = .82$ ) tried to decrease their negative emotions to the same extent as did participants in the decrease + reappraisal condition ( $M = 4.75, SD = .94$ ),  $t < 1$ . Participants in both of these conditions tried harder to decrease their negative emotions than did participants in the watch condition ( $M = 2.85, SD = 1.52$ ),  $t_s(133) > 7.91, ps < .001$ .

Third, as predicted, participants in the decrease + reappraisal condition ( $M = 3.13, SD = 1.22$ ) reported using reappraisal more to decrease their negative emotions, compared with participants in the decrease only condition ( $M = 2.59, SD = 1.21$ ),  $t(133) > 2.14, p = .034$ , as well as to participants in the watch condition ( $M = 2.22, SD = 1.12$ ),  $t(133) = 3.65, ps < .001$ . There were no significant differences between participants in the watch condition and those in the decrease only condition in

the extent to which they used reappraisal to regulate their emotions,  $t(133) = 1.53, p = .13$ .

Finally, we tested whether participants in the decrease only condition were more likely to use other regulation strategies, such as distraction, to decrease their negative emotions. As expected, we found that participants in the decrease only condition ( $M = 2.80, SD = 1.64$ ) were more likely to use distraction to decrease their negative emotions compared with participants in the decrease + reappraisal condition ( $M = 1.98, SD = 1.25$ ) and to participants in the watch condition ( $M = 1.93, SD = 1.08$ ),  $t(133) > 2.91, ps < .005$ . There were no significant differences between participants in the watch and decrease + reappraisal conditions in their use of distraction,  $t < 1$ .

**Open-ended responses.** Responses were coded by three objective evaluators, who were unaware of the conditions participants were assigned to. Evaluators coded responses as involving reappraisal (1) versus not (0). For instance, an example of a response that was coded by all evaluators as involving reappraisal is: "I told myself that although what [the speaker] said was extreme, he does not represent the Palestinian population." An example of a response that was coded by all evaluators as not involving reappraisal was: "I took a deep breath and tried to relax. I tried to seal my feelings off." Agreement between judges was satisfactory (mean  $\kappa = .41$ ); therefore, we averaged across evaluators.

On average, our evaluators estimated that based on their open-ended responses, 28% in the watch condition, 29% of participants in the decrease only condition, and 55% of participants in the decrease + reappraise condition engaged in cognitive reappraisal. We then ran a one-way ANOVA, in which the use of reappraisal was the predicted variable and condition was the predictor. Use of reappraisal varied by condition,  $F(2, 128) = 7.89, p = .001$ . Pairwise comparisons confirmed that participants in the decrease + reappraise condition engaged in significantly more reappraisal than did participants in the decrease only condition, and those in the watch condition,  $t(126) < -3.34, ps = .001$ . There were no significant differences between participants in the decrease only condition and participants in the watch condition,  $t < 1$ .

**Discussion.** The results of Study 3B replicate and extend the findings in Study 3A. First, we provided evidence for our claims using both self-report and physiological data, showing that instructing people to decrease their negative emotions can be as effective as instructing them to do so using cognitive reappraisal. Second, using two distinct sources of data (self-reports and coded descriptions of thought content during the film) we showed that participants in the decrease only condition did not simply use reappraisal to the same extent as did participants in the decrease + reappraise condition, which could explain the lack of difference between the two conditions. Instead, our two sources of data suggest that participants in the decrease only condition used as much reappraisal as did participants in the watch condition.

Taken together, these findings suggest that activating prohedonic emotion goals can facilitate effective emotion regulation. Indeed, in cases such as the ones examined in our studies, it may be as efficient as providing instructions for using cognitive reappraisal as means. This suggests that when an emotion goal is

activated, people may recruit whatever means are available at their disposal to pursue this goal effectively. These findings are consistent with the possibility that at least in some cases, effects that have been attributed to using the strategy of cognitive reappraisal may have been partly driven by the activation of prohedonic emotion goals.

#### Part 4: A Review of the Literature on Cognitive Reappraisal

Parts 1–3 of this investigation demonstrate the importance of distinguishing between the effects of activating prohedonic emotion goals and implementing cognitive reappraisal as means. However, have the effects of goals and means indeed been confounded in the literature? To address this question, we systematically reviewed how cognitive reappraisal has been assessed and manipulated in published research to date. We examined how often this was done in a manner that introduces a potential confound between the goal of regulation and the means of regulation used in its pursuit (i.e., cognitive reappraisal).

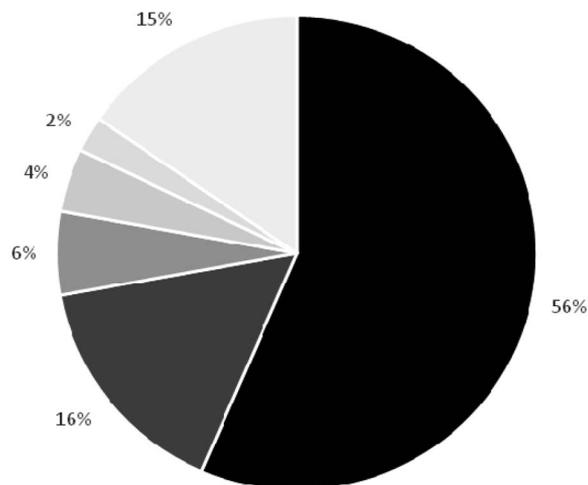
#### Method

We searched PsycNET, using the term "cognitive reappraisal" and limiting the search to peer-reviewed papers. The search resulted in 781 papers. Of those, 53 were not published in English and 126 were not directly relevant to cognitive reappraisal in the context of emotion regulation, leaving 602 relevant papers. We then distinguished between papers in which cognitive reappraisal was measured as an individual difference and those in which it was experimentally manipulated. In papers in which cognitive reappraisal was measured, we identified the specific measure that was used. In papers in which cognitive reappraisal was manipulated, we identified: (a) the instructions used in the manipulation, whether they included a manipulation of emotion goals, and if so, which emotion goal was manipulated, and (b) the other experimental conditions included in the design.

#### Results and Discussion

Table 1 in the supplementary materials provides the complete list of papers we reviewed, and an indication of whether cognitive reappraisal was measured or manipulated in each study, which measure was used, the nature of experimental conditions included in the design, and in which direction participants were instructed to regulate their emotions. Cognitive reappraisal was measured in 327 papers, manipulated in 232 papers, and both measured and manipulated in 43 additional papers.

**Measuring cognitive reappraisal.** Cognitive reappraisal was measured in 370 papers (62% of the papers reviewed). As summarized in Figure 4, the most common measure used to assess cognitive reappraisal was the cognitive reappraisal subscale of the ERQ (Gross & John, 2003), which was used in 209 papers (56% of the papers that measured reappraisal). Considering the remainder of the papers, 58 papers (16%) used the Cognitive Emotional Regulation Questionnaire (CERQ), in its long (Garnefski, Kraaij, & Spinhoven, 2002) or short (Garnefski & Kraaij, 2006) forms, 21 papers (6%) used the Thought Control Questionnaire (TCQ; Wells & Davies, 1994), and the remaining papers used a variety of other



- ERQ - Emotion Regulation Questionnaire
- CERQ - Cognitive Emotion Regulation Questionnaire
- TCQ - Thought Control Questionnaire
- WCQ - Ways of Coping Questionnaire
- COPE
- Other

Figure 4. Distribution of self-report measures used to assess individual differences in cognitive reappraisal (Part 4).

measures or interviews (e.g., Moos, 1993; Nezlek & Kuppens, 2008).

As we showed in Part 2 of this investigation, the reappraisal subscale of the ERQ inherently confounds the frequency of implementing cognitive reappraisal with the frequency of pursuing prohedonic emotion goals. Our literature review indicates that this scale is currently the most common measure of individual differences in cognitive reappraisal. With respect to other common measures for assessing cognitive reappraisal, these also overwhelmingly target prohedonic emotion goals. First, the CERQ is designed to assess what people think after experiencing a negative event. The Positive Reappraisal subscale of the CERQ includes 4 items that explicitly assess attempts to attach positive meaning to the negative event (e.g., “I think that I can learn something from the situation”, “I look for the positive sides to the matter”). Second, the TCQ includes 30 items that explicitly target techniques for controlling (i.e., attempting to decrease) unpleasant or unwanted thoughts (e.g., “When I experience an unpleasant/unwanted thought, I call to mind positive images instead”). Third, the Ways of Coping Questionnaire (WCQ) also assesses ways in which people deal with negative events. The Positive Reappraisal Subscale of the WCQ includes seven items. Of these, 5 items explicitly refer to reappraising in positive ways (e.g., “changed or grew as a person in a good way,” “rediscovered what is important in life”), and two items are nondirectional (i.e., “I prayed,” “I changed something about myself”). Finally, the COPE similarly examines ways in which people deal with negative events. The Positive

Reinterpretation and Growth subscale of the COPE includes four items, all of which explicitly refer to positive outcomes (e.g., “I try to grow as a person as a result of the experience”). Taken together, this analysis indicates that the vast majority of measures commonly used to assess cognitive reappraisal confound the use of cognitive reappraisal with the pursuit of prohedonic emotion goals. This suggests that correlates of such scales may be attributed, in part, to the tendency to pursue prohedonic goals.

**Manipulating cognitive reappraisal.** Cognitive reappraisal was manipulated in 273 papers (46% of the papers) in our review. When cognitive reappraisal was manipulated, in 202 papers (74%) participants were instructed to use cognitive reappraisal to pursue only prohedonic emotion goals (see Figure 5). For example, cognitive reappraisal was manipulated using the instructions reported in Gross (1998) or close variations of it (see item 7 in Table 1) in approximately 20% of the studies. As demonstrated in Part 3 of the investigation, these instructions manipulate both a prohedonic goal and cognitive reappraisal as means and their effect may be driven, in part, by the former.

Of the 202 studies in which cognitive reappraisal was manipulated in a prohedonic direction, 106 studies (52%) compared the manipulation of cognitive reappraisal to a control condition, in which participants were neither instructed to regulate their emotions in a prohedonic direction nor to use cognitive reappraisal. The effects in such studies, therefore, could theoretically be attributed to the use of cognitive reappraisal or to the activation of prohedonic emotion goals. In addition, 15% of the studies in which cognitive reappraisal was manipulated in the pursuit of prohedonic goals, compared the effects of cognitive reappraisal to the effects of expressive suppression (i.e., a strategy that involves inhibiting the overt expression of emotion). The findings in these studies may also be attributed to either the effects of cognitive reappraisal or to the effects of activating prohedonic goals.

In studies in which either prohedonic or counterhedonic emotion goals were activated (i.e., participants were instructed to either increase or decrease the intensity of their emotions), in 183 papers

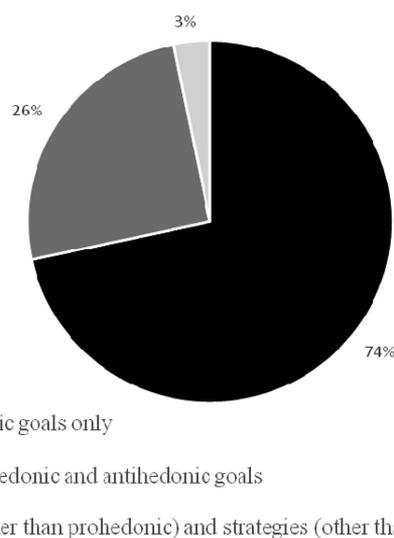


Figure 5. Distribution of manipulated variables in experimental studies of cognitive reappraisal (Part 4).

(67% of the cases), emotions were regulated using only cognitive reappraisal, and no other emotion regulation strategy. Such a design leaves open the possibility that the effects were the result of activating prohedonic versus counterhedonic emotion goals rather than using cognitive reappraisal, in particular, to pursue them.

**Summary.** Taken together, our review demonstrates that in the majority of published articles on cognitive reappraisal, there is a potential confound between the possible effects of activating prohedonic goals and the effects of using cognitive reappraisal to pursue them. Given the measures that were used to assess individual differences in cognitive reappraisal, and the manipulations and study designs used to test the effects of cognitive reappraisal, effects that were previously attributed to cognitive reappraisal could potentially be attributed to the activation of prohedonic emotion goals.

### General Discussion

If we want to get people to the museum, we first need to motivate them to get there. In this investigation, we demonstrate that the same principle applies to emotion regulation. If we want to get people to decrease their negative emotions, we first need to motivate them to do so. Much of the research on emotion regulation to date focused on cultivating the use of effective strategies to regulate emotions, assuming that people are already motivated to decrease their negative emotions or to increase their positive emotions. However, other research has found that this is not necessarily the case (for a review, see Tamir, 2016). Even though people generally want to feel good, they often fail to try to regulate their emotions, letting their emotions run their course instead (e.g., Suri, Whittaker, & Gross, 2015). Our investigation shows that given the variability in emotion goals, activating prohedonic goals may be as important for decreasing negative emotions as using effective means to pursue them. Indeed, we show that effects that have previously been attributed to cognitive reappraisal, an effective emotion regulation strategy, may have been due (at least partially) to the activation of prohedonic emotion goals.

Our data also provides evidence for the distinct contributions of activating an emotion goal and activating means to pursue it. We provide initial evidence for the possibility that motivating people to decrease their negative emotions may be a critical (and in some cases, even sufficient) step in bringing about desired emotional change. This is likely because the activation of an emotion goal automatically triggers whichever means of emotion regulation people already have at their disposal, including but not limited to cognitive reappraisal. If goals can activate accessible means, in some cases, activating emotion goals may be sufficient for bringing about desired changes in emotion.

First, we showed that participants understand measures and manipulations of reappraisal as referring both to the means by which they should regulate their emotions (i.e., use cognitive reappraisal) and to the goal of regulation (i.e., decrease negative or increase positive emotions). Second, we show that the associations between the common measure of cognitive reappraisal and indices of affective and psychological functioning may be attributed to both the frequent use of cognitive reappraisal and to the frequent pursuit of prohedonic goals. Third, in two experimental studies, we found that simply instructing people to decrease their negative emotions resulted in significant decreases in negative emotional

reactions. On the other hand, asking people to use cognitive reappraisal without specifying an emotion goal, led people to try to decrease, maintain, or even increase their negative emotions, demonstrating that people do not always want to feel better. Indeed, motivating people to decrease their negative emotions was as effective as instructing people to use cognitive reappraisal to decrease their negative emotional reactions. Finally, in an extensive review of the literature, we were able to demonstrate that the confound between goals and means in cognitive reappraisal is not hypothetical. Instead, it is prevalent in existing research on cognitive reappraisal. Such research has often confounded the potential effects of using cognitive reappraisal with those of activating prohedonic goals, potentially inflating the impact attributed to the former. Below, we discuss some of the implications of our findings for theory and practice in emotion regulation.

### The Interplay of Goals and Strategies in Emotion Regulation

The initiation of any act of self-regulation requires the activation of a goal. Once a goal is activated, the efficacy with which it is pursued depends, in part, on the efficacy of the means to pursue it. Effective goal pursuit depends on the use of proper and goal-appropriate means. Nonetheless, the mere activation of a goal is sufficient to automatically trigger the use of accessible means and related behaviors (Fishbach & Ferguson, 2007). Building on these ideas, we argue that emotion regulation depends, in part, on the activation of emotion goals. Once an emotion goal is activated, it automatically triggers relevant available regulation strategies. In such instances, people are likely to engage in whatever accessible means they have at their disposal, setting regulatory action in motion. Furthermore, if the efficacy of means to regulate emotions depends on which emotion goal is activated, activating specific emotion goals may trigger means that are particularly suited to pursue the target emotion goal. Therefore, a person who tries to decrease her negative emotions is likely to subsequently show greater decreases in negative emotions, compared with a person who is not trying to do so, regardless of the means they use. Our findings provide support for these claims, by showing that participants who were instructed to decrease their emotions showed significant decreases in both self-reported and physiological indices of emotional intensity, compared with people who were instructed to respond naturally. Compared with people who were explicitly instructed to decrease their emotions using cognitive reappraisal, individuals who were instructed to decrease their emotions without specifying how to do so, used less cognitive reappraisal and more distraction. Activating emotion goals, therefore, can set regulatory behavior in motion.

These findings contribute to research on emotion goals (for a review, see Tamir, 2016; Tamir & Millgram, 2017), reinforcing the importance of considering them as causal factors in emotion regulation. Although goals cannot be pursued without means, and means cannot be used without goals, emotion goals, and emotion regulation strategies can each impact emotion regulation in different and independent ways. Our findings demonstrate that people are not always motivated to regulate their emotions or to do so in prohedonic ways. This implies that impairments in emotion regulation may be attributed either to the use of ineffective emotion regulation strategies, or to the failure to pursue adaptive emotion

goals. For instance, emotion regulation impairments in depression have been typically attributed to the use of dysfunctional strategies (see Joormann & Siemer, 2014). However, recent evidence suggests that such impairments might also be attributed to the pursuit of dysfunctional emotion goals (Millgram, Joormann, Huppert, & Tamir, 2015).

The present findings point to the importance of identifying the unique contribution of emotion goals to emotion regulation. They suggest that such contributions may have led to misattributing the potential effects of goals to emotion regulation strategies, such as cognitive reappraisal. In this investigation, when attempting to replicate a classic study on cognitive reappraisal (Gross, 1998), we found that participants who were instructed to decrease their negative emotions, without being told how to do so, were as effective in doing so as were participants instructed to use cognitive reappraisal to regulate their emotions. This effect could not be explained by the spontaneous use of reappraisal in the former group, as participants who were instructed to decrease their emotions reported using less cognitive reappraisal than did participants who were instructed to use cognitive reappraisal. Instead, some of these participants used alternative strategies, like distraction. These effects do not challenge the utility of cognitive reappraisal as an effective regulation strategy. However, they indicate that, at least in some contexts, instructing people to regulate their emotions in a specific direction may ultimately trigger congruent changes in emotional experiences. Indeed, people are able to use cognitive reappraisal spontaneously (see Gross & John, 2003), when they want to decrease negative emotions.

### Implications for Research and Practice in Emotion Regulation

To predict and influence the outcomes of emotion regulation, it is important to be able to assess the contribution of activating emotion goals and using specific means to pursue them. This implies that when assessing correlates of individual differences in using certain strategies, it is necessary to control for the potential contribution of pursuing prohedonic (or more specific) emotion goals. Furthermore, some research designs are likely more conducive to that effect than others. Distinguishing between effects of goals and strategies may not be possible in studies that manipulate both the goal and the strategy of regulation and compare them to a control condition, where neither goal nor strategy are manipulated (e.g., Denson, Creswell, Terides, & Blundell, 2014; Sarkheil et al., 2015). For instance, comparisons between cognitive reappraisal and expressive suppression may be problematic as tests of the process model of emotion regulation (e.g., Gross, 1998), as they confound the impact of goals and strategies.

Similarly, distinguishing between effects of goals and strategies may not be possible in studies that manipulate the direction of using an emotion regulation strategy (e.g., increase, decrease) and compare them to a control condition, where no other strategy is manipulated (e.g., Ahn et al., 2015; Morris, Leclerc, & Kensinger, 2014). To identify the unique effects of goals and strategies it is necessary to independently manipulate both goals and strategies of regulation. Such independent manipulations could also enable researchers to test whether goals moderate the effects of emotion regulation strategies, such that some strategies are optimal for attaining particular emotion goals, but not others.

If both goals and strategies shape emotion regulation, it may be necessary to target both of them when designing emotion regulation interventions. This is important because people are not necessarily motivated to regulate their emotions (e.g., Kuppens, Allen, & Sheeber, 2010; Suri et al., 2015), nor are they equally motivated to regulate emotions in a prohedonic manner (e.g., Millgram et al., 2015; Porat, Halperin, & Tamir, 2016). In such cases, changing emotions adaptively may require motivating people to do so. Indeed, as our findings in Studies 3A and 3B suggest, there are cases in which motivating people to decrease their emotions may be sufficient to facilitate desired changes in emotion regulation. For example, motivating people to decrease their anger toward outgroup members was sufficient for reducing the experience of anger toward outgroup members after an anger-inducing event (Porat, Halperin, & Tamir, 2016). Our findings suggest that at least in some cases, interventions should focus on activating adaptive emotion goals, with or without training people to use specific means to do so.

### Limitations and Future Directions

Although our findings suggest that the activation of prohedonic goals may account for some of the effects that have been previously attributed to cognitive reappraisal, they are still preliminary. First, it would be beneficial in the future to conduct a meta-analysis on the relevant literature identified in Part 4 of this investigation. Such a meta-analysis could test, for instance, whether the effect of cognitive reappraisal is weaker when compared with other strategies that involve the same emotion goal (e.g., distraction), compared with other goals (e.g., expressive suppression). It could also test whether the effects of reappraisal are weaker when reappraisal manipulations are nondirectional, compared with directional.<sup>7</sup> We encourage scholars to undertake such meta-analysis efforts, while also considering the broader context of regulation (e.g., the nature of stimuli and general instructions).

Second, our experimental studies failed to find a difference between instructions to decrease negative emotions and the classic reappraisal manipulation, which involves both instructions to decrease negative emotions and instructions to use cognitive reappraisal to do so. We believe such null findings are meaningful, especially as they were found along significant differences when compared with a control condition. Nonetheless, we cannot rule out the possibility that these null findings are because of chance, lack of statistical power, or some methodological artifact. Future research should replicate the present findings in other contexts, using larger samples. For example, future research should examine the potential impact of emotion goal activation and cognitive reappraisal outside the laboratory, as people regulate emotional reactions in their daily lives. Such research should further examine the efficacy of activating prohedonic emotion goals in regulating emotions and the specific conditions under which doing so might be sufficient to propel effective emotional change. Future research should also identify the process by which activating emotion goals brings about subsequent changes in emotional experiences.

Similarly, to better understand the impact of different emotion regulation strategies, future research should compare cognitive

<sup>7</sup> We thank anonymous reviewers for making these suggestions.

reappraisal to other emotion regulation strategies, when pursuing the same emotion goal. For instance, Sheppes and colleagues (e.g., Sheppes et al., 2014) compared the efficacy of cognitive reappraisal and distraction in decreasing negative emotions, and found that reappraisal was more effective than distraction in some conditions, but not in others. We believe that this approach may be particularly useful for understanding the unique strengths and limitations of cognitive reappraisal and other strategies.

In this investigation, we focused on prohedonic emotion goals and on cognitive reappraisal. However, it would be useful in the future to test whether our findings generalize to other types of emotion goals and to other types of emotion regulation strategies. With respect to emotion goals, it would be beneficial to evaluate the impact of activating not only prohedonic, but also antihedonic, emotion goals. Future research could also distinguish between specific types of prohedonic (or antihedonic) goals. Trying to decrease negative emotions may have different implications than trying to increase positive emotions. Similarly, trying to decrease sadness may have different implications than trying to decrease anger. Future research could also test the impact of the emotional context. Trying to regulate intense emotions, for instance, may be different from trying to regulate more moderate emotions. With respect to emotion regulation strategies, future research could assess whether goals and means are similarly confounded in other emotion regulation strategies, such as expressive suppression, distraction, and rumination.

There are likely additional constraints on the generality of our findings. Our investigation was designed to demonstrate that the activation of emotion goals can lead to goal-congruent changes in emotional experience. Our studies further show that, at least under certain circumstances, activating prohedonic emotion goals can be as effective as instructions to pursue such goals using cognitive reappraisal. Our findings, however, were obtained in unique laboratory settings, using emotional contexts designed to facilitate a range of emotion goals. Our experimental studies created contexts in which participants were not unanimously motivated to decrease negative feelings, as such feelings could have offered potential social or epistemic benefits (e.g., Jewish participants may be motivated to feel sad in response to a film about the holocaust, to the extent that such feelings connect them to their group; see Porat, Halperin, Mannheim, et al., 2016). Although such contexts occur in real life, they are less common in laboratory tests of emotion regulation. We expect our findings to replicate in emotional contexts in which people may be motivated to maintain or increase their negative feelings. We have no reason to believe the results depend on other characteristics of the participants, materials, or context. Future research might uncover such dependencies, which would promote a better understanding of the role of goals and means in emotion regulation.

Future research should also examine the interplay of different emotion goals and different regulation strategies. Although we considered goals and strategies as independent, it is likely that the two often depend on one another. For instance, the pursuit of certain goals may trigger the use of particular emotion regulation strategies that are better equipped to pursue them (Millgram, Sheppes, Kalokerinos, Kuppens, & Tamir, 2018). Similarly, it may be the case that the use of certain emotion regulation strategies increases the likelihood of pursuing emotion goals that are easier to pursue with these strategies than with others. Exploring the

potential interplay between goals and strategies in emotion regulation may be a particularly promising avenue for future research. In this respect, it would be important to study the interdependence of goals and strategies both in general (e.g., are some emotion goals more likely to activate specific emotion regulation strategies?) and as an individual difference (e.g., is a prohedonic goal more likely to initiate reappraisal in some people, but not in others?). The current findings suggest that understanding when, why and how people adopt certain goals in emotion regulation might be as important as understanding when, why and how they use certain strategies in emotion regulation.

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Received April 19, 2017

Revision received September 3, 2018

Accepted October 2, 2018 ■