Journal of Experimental Psychology: General
2014, Vol. 143, No. 1, 163–181

0096-3445/14/$12.00 DOI: 10.1037/a0030831

Emotion Regulation Choice: A Conceptual Framework and Supporting Evidence

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Choice behavior is considered the fundamental means by which individuals exert control over their environments. One important choice domain that remains virtually unexplored is that of emotion regulation. This is surprising given that healthy adaptation requires flexibly choosing between regulation strategies in a manner that is responsive to differing situational demands. In the present article, we provide a broad conceptual framework that systematically evaluates the rules that govern the ways individuals choose between different emotion regulation strategies. This conceptual account is buttressed by empirical findings from 6 studies that show the effects of hypothesized emotional, cognitive, and motivational determinants of regulation choice (Studies 1–3) and illuminate the mechanisms that underlie choices between different emotion regulation strategies (Studies 4–6). Broad implications and future directions are discussed.

Keywords: choice, emotion regulation, self-control, engagement, disengagement

From deciding whether to have coffee or tea at a cafe to deciding whether to marry or break up, choice behavior is considered a primary means by which individuals exert control over the environment (Leotti, Iyengar, & Ochsner, 2010). It is therefore not surprising that choice behavior has been extensively studied across psychological subdisciplines, especially in judgment and decision making (Marewski & Schooler, 2011). Across a number of different choice contexts, researchers' empirical efforts have involved exposing and systematizing the rules that govern how individuals choose between available alternatives to control their differing environments.

One choice context that has not yet received attention is emotion regulation. By this, we mean the choices individuals make as to how they should regulate their emotions in a particular context when regulation is warranted. Our starting point for an analysis of emotion regulation choice is the idea that our emotions often are advantageous for survival and well-being (Damasio, 1999). In some situations, however, emotional states are potentially maladaptive (see Aldao, Nolen-Hoeksema, & Schweizer, 2010, for review) and thus become the target of change (e.g., Gross, Sheppes, & Urry, 2011a, 2011b, for reviews). More than a decade of research has shown that emotions can be regulated in many ways and that emotion regulation strategies have very different consequences in different situations (e.g., Gross, 1998, 2001; Gross & Thompson, 2007; Koole, 2009; Parkinson & Totterdell, 1999; Tamir, 2009, 2011, for reviews). Accordingly, several recent conceptual accounts suggest that flexible choice between emotion regulation strategies is central for well-being and that various forms of psychopathology can be characterized by a breakdown in flexible regulation choice (see Kashdan & Rottenberg, 2010; Opitz, Gross, & Urry, 2012; Troy & Mauss, in press, for recent reviews).

Although the importance of choosing between available emotion regulatory options is now clear, little is known about emotion regulation choice. To address this gap in the literature, we begin by elaborating on the importance of emotion regulation choice and on the present lack of supporting empirical evidence. We then present a new conceptual framework and supporting evidence that explain the consequences of implementing different emotion regulation

This article was published Online First November 19, 2012.

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Gal Sheppes is supported by Israel Science Foundation Grant No. 1393/12. We thank the following research assistants for their help: Jordan Tharp, Mayra Burguera, Consuelo Soliz, Jennifer Yih, Victor Portnoy, Tzippi Shvili, Mervi Rannisto, Annie Robertson, Derek Rowley, Ellora Israni, Joan Jou, Tara Guarino, Tyler Webster, Anna Obermayr, and Ricarda Essl.

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strategies (Sheppes & Gross, 2011, 2012). This model is then used to make specific predictions regarding key emotional, cognitive, and motivational factors that determine emotion regulation choice, followed by initial empirical support for emotional determinants of emotion regulation choice (Sheppes, Scheibe, Suri, & Gross, 2011). We then present findings from six studies. Given the relative lack of empirical knowledge about emotion regulation choice and the abundance of knowledge about the consequences of deliberately implementing explicit emotion regulation strategies (see Gross, 2007, for a comprehensive review), our entry point in the present set of studies involves concentrating on explicit and deliberate emotion regulation choice. These studies extend our account in two important ways: (a) by providing empirical support for the complete framework involving emotional, cognitive, and motivational determinants of emotion regulation choice (Studies 1–3); and (b) by providing an underlying mechanism and ruling out key alternative interpretations to our basic predicted findings (Studies 4–6).

Emotion Regulation Choice Is Important But Understudied

Despite a long-standing interest in how individuals control their emotions, emotion regulation has only recently emerged as an independent field of study within affective science (Gross, 1998, 2007, 2010; Koole, 2009; Tamir, 2011). One of the central concerns in this nascent field has been assessing whether different forms of emotion regulation have different consequences. Typically, findings have been cast in terms of different forms of emotion regulation being either adaptive or maladaptive.

To give two canonical examples, consider first Nolen-Hoeksema's influential work on rumination versus distraction (Nolen-Hoeksema, 1991; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008, for reviews). Multiple studies have convincingly demonstrated that ruminating on negative aspects of the self functions as a strong diathesis for the development, maintenance, and recurrence of depressive episodes relative to distracting attention away from emotional processing. As a second example, consider Gross's influential work on the maladaptive profile of suppressing one's emotions relative to the adaptive nature of reappraising the meaning of negative events (Gross, 2002; Gross & Thompson, 2007, for reviews). Here, too, multiple studies have demonstrated the relative superiority of reappraisal over suppression with respect to a wide range of affective, cognitive, and social indicators of adaptive functioning. The centrality of the dichotomy between "good" and "bad" forms of emotion regulation is captured by a recent meta-analysis that summarized a decade of work on the relationship between certain regulation strategies (rumination, suppression) and psychopathology and other strategies (reappraisal, problem solving) and resilience (Aldao et al., 2010).

These studies have enormously advanced the field of emotion regulation. However, a new generation of studies has begun to cast doubt on the unconditional maladaptive/adaptive label given to different strategies. For example, the ostensibly maladaptive strategy of rumination was found to be advantageous in situations in which a single goal needs to be maintained in the face of distractors (Altamirano, Miyake, & Whitmer, 2010), and the ostensibly maladaptive strategy of suppression was shown to be less disadvantageous for Eastern relative to Western cultures (e.g., Butler, Lee, & Gross, 2007) or even beneficial in extremely adverse situations (e.g., Bonanno & Keltner, 1997). At the same time, the ostensibly adaptive strategy of distraction was found to be maladaptive when long-term adjustment is required (Kross & Ayduk, 2008), and the ostensibly adaptive strategy of reappraisal was found to be ineffective and costly when dealing with particularly high-intensity emotional situations (Sheppes, Catran, & Meiran, 2009; Sheppes & Meiran, 2007, 2008).

What is becoming clear is that emotion regulation strategies have different consequences in different contexts. This means that healthy adaptation is the result of flexibly choosing between regulation strategies to adapt to differing situational demands (e.g., Bonanno, 2005; Kashdan & Rottenberg, 2010; Troy & Mauss, in press, for reviews). For example, Kashdan and Rottenberg (2010) show that a breakdown in flexible regulation choice characterizes various forms of psychopathology, and Troy and Mauss's (in press) and Bonanno's (2005) influential accounts highlight the role of flexible regulation choice for resilience in the face of stress and trauma.

Although emotion regulation choice is now viewed as a crucial element in healthy adaptation, it has not been directly studied. That is because previous experimental research has directly instructed participants to use regulation strategies in different situations, and not examined which regulation strategies are chosen in different emotional contexts. Consider, for example, the most direct and convincing evidence regarding the importance of flexible regulation patterns, which showed that the ability to flexibly alternate between enhancing and suppressing emotion strongly predicts healthy adaptation (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004), over an extended time period (Westphal, Seivert, & Bonanno, 2010), and that flexible regulation can protect from complicated grief patterns in bereavement (Gupta & Bonanno, 2011). In these and other studies, the regulation strategies used by participants were determined by the experimenter, leaving the important topic of determinants and consequences of emotion regulation choice unexplored.

A New Conceptual Framework for Studying Emotion Regulation Choice

Recently, we proposed a new conceptual framework that accounts for the consequences of using different regulation strategies in different contexts (Sheppes & Gross, 2011, 2012). Although the original goal of this framework was to explain the consequences of strategy implementation, after we describe its basic logic and preliminary supporting findings, we apply this framework to emotion regulation choice.

This conceptual framework is predicated on the idea that individuals have a limited cognitive capacity that poses enduring processing constraints. These constraints result in a constant competition between emotion generation and emotion regulation processes (Gross et al., 2011a, 2011b) for dominance over the output of the cognitive system, namely behavior. Our account draws on major information-processing theories (e.g., Hübner, Steinhauser, & Lehle, 2010; Pashler, 1998) and the process model of emotion regulation (Gross & Thompson, 2007) to suggest that goal-driven behavior, such as regulating one's emotions, can involve recruiting *deliberate executive control mechanisms* that can modify the nature of emotional information processing at two major cognitive

stages. Specifically, the two major cognitive stages in which information flow can be strategically regulated include an early *disengagement* from emotional processing at an attentional selection stage and an *engagement* with emotional processing that is modulated at a late semantic meaning stage (e.g., Johnston & Heinz, 1978; Lehle & Hübner, 2008). Our model may be illustrated by focusing on two regulatory strategies that have their major influence in each of these two cognitive stages of information processing.

Incoming emotional information can be regulated at an early attentional selection processing stage by disengaging from emotional information processing before it undergoes elaborated processing. A classic early selection strategy is *distraction*, which involves disengaging attention from emotional processing before it is represented in working memory by producing neutral thoughts that are independent from and not in conflict with emotional information (e.g., Van Dillen & Koole, 2007).

Engagement with incoming emotional information that passes the early attentional selection stage can still be regulated at a late semantic meaning-processing stage before it affects behavior. A classic late selection regulation strategy is *reappraisal*, which involves engaging with and elaborating emotional information prior to changing its meaning in a late processing stage (e.g., Gross, 2002). In reappraisal, the neutral reinterpretation is semantically dependent and in direct conflict with the original emotional information.

According to our framework, these underlying characteristics of disengagement distraction and engagement reappraisal result in a differential cost–benefit trade-off. Specifically, the benefits of blocking emotional information early before it gathers force via distraction are that *emotionally* high-intensity information can be successfully modulated. *Cognitively*, this successful modulation engages relatively simple processes, because the generation of regulatory neutral thoughts in distraction are independent from and not in conflict with the original emotional information. Nevertheless, the major cost of distraction is that *motivationally* it does not allow processing, evaluating, and remembering emotional information, which are crucial for one's long-term *goals* and adaptation (Wilson & Gilbert, 2008, for a review). Specifically, distraction is not conducive to emotional events being repeatedly attended to and provided with adequate explanation, a requirement that is at the heart of many long-term goals where an individual has to face difficulties and of adaptation.

The underlying characteristics of engagement reappraisal result in a different set of costs and benefits. Specifically, the elaborated semantic processing that occurs prior to late modulation should be emotionally costly as it can less successfully block high-intensity emotional information. Cognitively, reappraisal engages relatively complex processes, because the generation of alternative construals is dependent on and in conflict with the original emotional information. Nevertheless, the major benefit of engaging with emotional information is that motivationally it allows processing, evaluating, and remembering emotional information, which are crucial for long-term goals and for adaptation.

Initial Empirical Support for the Framework

Most of the empirical support for our conceptual framework comes from recent behavioral and electrophysiological studies in which participants were instructed to use (rather than freely choose between) distraction and reappraisal under different contexts. Specifically, several behavioral studies showed that using early disengagement distraction in high sadness *emotional* intensity situations resulted in successful regulation (Sheppes & Meiran, 2007), and did not result in an increased expenditure of *cognitive* resources (Sheppes et al., 2009; Sheppes & Meiran, 2008). At the same time, distraction's lack of emotional processing and its long-term *motivational* cost were demonstrated in an impaired memory for emotional information (Sheppes & Meiran, 2007, 2008) and in no long-term attenuation of the intensity or quality of important negative autobiographical emotional events following distraction (Kross & Ayduk, 2008). By contrast, these studies showed that although using late engagement reappraisal in low-sadness emotional intensity situations was successful, under high-sadness emotional intensity, situations resulted in less successful modulation, and resulted in an increased expenditure of cognitive resources. The elaborated emotional processing and its motivational benefit evinced in intact memory for emotional information (see also Dillon, Ritchey, Johnson, & LaBar, 2007; Richards & Gross, 1999, 2000) and in adaptation to distressing events that are important for one's long-term goals and functioning following reappraisal.

In two recent electrophysiological studies, we took advantage of the excellent temporal resolution of electroencephalogram and event-related potentials to provide further support for the differential underlying cognitive mechanisms and consequences of using distraction and reappraisal (Blechert, Sheppes, Di Tella, Williams, & Gross, 2012; Thiruchselvam, Blechert, Sheppes, Rydstrom, & Gross, 2011). In particular, we built on recent emotion regulation studies that showed that distraction (e.g., Dunning & Hajcak, 2009; Hajcak, Dunning, & Foti, 2009) and reappraisal (e.g., Foti & Hajcak, 2008; Hajcak & Nieuwenhuis, 2006) modulate the late positive potential (LPP)—an electrocortical component that is enhanced during emotionally arousing viewing and that reflects enhanced processing of emotionally salient information (Hajcak, MacNamara, & Olvet, 2010).

Consistent with our framework, we found that distraction involved a strong modulation of an initial phase of the LPP that represents an early disengagement before emotional information is represented in working memory, and reappraisal only modulated the late phase of the LPP, which represents engagement and elaborated meaning prior to late modulation (Thiruchselvam et al., 2011). In that same study, we also tested our prediction that motivationally, distraction relative to reappraisal cannot accord with long-term goals because distraction does not allow attending and explaining emotional information (Wilson & Gilbert, 2008). To that end, our participants were reexposed to emotional materials they have previously distracted or reappraised. Consistent with our prediction, we found that emotional materials with a distraction but not reappraisal history demonstrated a rebound effect (an enhanced LPP during reexposure) that represents an extended influence of negative emotional processing beyond the regulatory episode and that is incongruent with one's long-term goals that require dealing with emotional events that are repeatedly encountered (see also MacNamara, Ochsner, & Hajcak, 2011). In a similar vein, we recently showed that repeated reappraisal efforts with biologically significant emotional stimuli (i.e., angry facial expressions) resulted in a gradual change to the basic evaluation and thus representation of these emotional stimuli (Blechert et al., 2012).

Determining Emotion Regulation Choice

Conceptual Logic and Initial Empirical Support

In using our framework to examine emotion regulation choice, our working assumption was that in many cases, regulatory choices of healthy individuals would be sensitive to costs and benefits associated with each regulatory option in a particular context. If this assumption is correct, certain emotional, cognitive, and motivational contextual factors should bias regulatory choices in ways that are congruent with the differential consequences of implementing these strategies under these various conditions (see Part I below for elaboration). Furthermore, according to our conceptual account, adaptive emotion regulation choice should involve an ability to operate deliberate executive control processes that can override the direct influence of fast associative emotional processes. This assumption is congruent with the finding that healthy adaptation requires the ability to restrain affective impulses (e.g., Muraven & Baumeister, 2000). In addition, our account holds that a key determinant of emotion regulation choice is each strategy's underlying mechanism. Specifically, when considering distraction, individuals mainly evaluate their preference to perform early regulatory disengagement from emotional processing via selective attention, and when considering reappraisal, individuals mainly evaluate their preference to perform engagement with emotional processing prior to a late semantic meaning regulatory modulation (see Part II below for elaboration).

Recently, we tested one aspect of this account by seeing how systematically varying negative emotional intensity would affect emotion regulation choice (Sheppes et al., 2011). We predicted that in low-negative emotional intensity situations, individuals would prefer to choose late selection engagement reappraisal over early selection disengagement distraction because reappraisal can both successfully modulate emotional responding and provide long-term affective adaptation. However, we predicted that in high-negative intensity situations, participants would switch to prefer to choose early disengagement distraction over reappraisal, because only distraction can successfully block emotional information early before it gathers force.

To test our predictions, we manipulated emotional intensity with emotional images or unpredictable electric stimulation and had participants choose between distraction and reappraisal (Sheppes et al., 2011). The results strongly supported our predictions in both emotional contexts. Specifically, participants preferred to reappraise their emotional reactions to low-negative intensity pictures and to a threat of low-intensity electric shocks, but they preferred to distract from their emotional reactions to high-negative intensity pictures and to a threat of high-intensity electric shocks.

The Present Investigation

The present investigation had two major goals. Our first goal, which we pursue in Part I of this article, was to provide a more complete test of the emotional, cognitive, and motivational determinants hypothesized to play a role in emotion regulation choice (Studies 1–3). To that end, in Study 1, we wished to examine the robustness of our initial findings regarding the emotional determinants on emotion regulation choice. Specifically, we investigated whether the regulation preference we previously found under low- and high-intensity situations holds even when a potent reinforcer (varying amounts of money) is offered for choosing the nonpreferred regulation option. In Study 2, we tested for the first time the influence of a major cognitive determinant of emotion regulation choice. Specifically, we investigated how the relative simplicity of cognitively generating a regulation strategy affects regulation choice. In Study 3, we tested an important motivational determinant of emotion regulation choice. Specifically, we examined how forming short- versus long-term motivational goals affects emotion regulation choice. It is important to mention that in the present set of studies, the emotional, cognitive, and motivational factors were all externally manipulated. Nevertheless, it is generally assumed that these types of inductions function like bottom-up processing in the sense that external stimuli activate internal changes in the individual (see Ochsner et al., 2009, for a discussion).

Our second goal, which we pursue in Part II of this article, was to examine the mechanisms that underlie the choice patterns between distraction and reappraisal and to rule out several alternative explanations for our basic findings (Studies 4–6). To that end, in Study 4 we tested whether the basic preference to engage via reappraisal or disengage via distraction is best explained by the operation of deliberate executive control processes that override competing associative emotional processes. We did this by seeing whether reappraisal and distraction preferences are maintained when regulating low- and high intensities of *positive* emotional stimuli. Specifically, an increase in positive emotional intensity directly activates a basic appetitive system that motivates increased engagement, and thus a demonstration of opposing increased preference to disengage would demonstrate the involvement of deliberate executive processes that inhibit the appetitive system. In Studies 5 and 6, we tested whether individuals base their reappraisal and distraction choices on an evaluation of the consequences of engaging with or disengaging from emotional stimuli processing, rather than on considerations of cognitive effort or other differences that are inherent when comparing between two different regulation strategies.

Part I

Emotional, Cognitive, and Motivational Determinants of Emotion Regulation Choice

In this section, we provide a more complete test of our conceptual account (Sheppes & Gross, 2011, 2012) that highlights emotional, cognitive, and motivational determinants of regulation choice between distraction and reappraisal.

Study 1

Testing the Robustness of Emotional Determinants of Regulation Choice

We have recently shown that across diverse emotional situations, individuals preferred to choose late engagement reappraisal for low-intensity emotional situations, but switch to prefer choosing early disengagement distraction under high-intensity situations (Sheppes et al., 2011). The goal of the present study was to test the

robustness of the effect of emotional intensity of emotion regulation choice. Specifically, we examined whether individuals would keep their regulatory preferences under different emotional intensities even when offered a potent reinforcement to engage in a counterpreference regulatory option.

Participants chose between distraction and reappraisal for low- and high-intensity emotional images when each regulatory option was paired with a different monetary payment—a well-established reinforcer that powerfully influences motivational behavior (e.g., Delgado, Labouliere, & Phelps, 2006; Knutson, Adams, Fong, & Hommer, 2001). This resulted in two extraindependent measures in addition to emotional intensity (low, high): (a) valuable regulation option: which strategy was offered more money on a given trial (distraction or reappraisal) and (b) magnitude: the size of the difference (small or large). For this and the following studies, our main dependent measure was proportion of choice.

We predicted that money would have an effect on people's regulatory preferences, with an increase in a certain regulatory choice when it is paired with more money and with this influence being stronger when magnitude is large. However, we also predicted that people would continue to show a preference for late disengagement reappraisal under low-emotion intensity, and early disengagement distraction under high-emotion intensity, even when money was offered for using the opposite strategy.

Method

Participants. Twenty participants (14 women) completed the study for monetary compensation. Specifically, participants were offered a $2 base-rate pay together with a guaranteed $8.10–$10.50 based on their performance in the task (see below).

Stimuli. Participants watched a total of 80 pictures taken from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2008). The IAPS is a widely established and validated pictorial set that has been extensively used in affective science research. Although the pictorial system includes a wide range of stimulus types and contents, its major purpose is to induce differing intensities of emotional reactions (e.g., Bradley, Codispoti, et al., 2001). Specifically, picture stimuli can be ranked according to the degree that they activate different intensities of emotional reactions. Given that in our conceptual framework emotional intensity is a central factor, the use of the IAPS was ideal for our purposes. Specifically, for this experiment, we divided the 80 pictures participants saw into two types of differing intensity based on normative ratings of valence (1 = *very unpleasant*; 9 = *highly pleasant*) and arousal (1 = *low*; 9 = *high*). Specifically, 40 pictures were of relative low intensity (mean arousal = 5.00, mean valence = 3.39) and 40 of relative high intensity (mean arousal = 6.45, mean valence = 1.87[1]). Relative low-intensity pictures were significantly different in the normative IAPS ratings on valence and arousal dimensions from relative high-intensity pictures (both Fs > 71.03, ps $< .001$). Previous studies have established that arousal and valence differences of the magnitude that separate our relative low- and high-intensity categories are sufficient to create different levels of emotional response activation as obtained by physiological (Bradley, Codispoti, et al., 2001) and electrocortical markers of negativity (Weinberg & Hajcak, 2010). In addition, differences of this magnitude have proved to yield different regulatory preferences (Sheppes et al., 2011). In general, picture content was diverse and included threat, disgust, sadness, fear, and mutilations. Whenever possible, content was matched for the relative low- and high-intensity pictures. Among the various stimuli contents, those that symbolically represent threat including attack, death, human suffering, and mutilations most intensely activate the basic defensive system.

General procedure. The general procedure was similar in all six studies reported here. During a four-trial training phase, participants looked at negative pictures and were instructed to either (a) think about something that was emotionally neutral (distraction) or (b) think about the picture in a way that reduced its negative meaning (reappraisal).

Distraction instructions were as follows:

> Try your best to feel less negative about the picture by thinking of something that is completely unrelated to the picture. There are a few ways you can do this. First, you could imagine your neighborhood or other familiar streets. For instance, if you see a negative picture of a woman who has been burnt, you could think of biking around campus and the different buildings around you. Second, you could imagine yourself doing everyday tasks, such as taking a shower or making coffee in the morning. You could use any one of these ways to distract yourself that you think will work best in making you feel less negative, and you don't have to use the same way to distract all the time. However, it is important that you keep your eyes on the picture and not avert your gaze. Also, when distracting, it's important that you not focus on something that is highly emotional, so we don't want you to think about anything that brings you sadness or extreme happiness.

Reappraisal instructions were as follows:

> Try your best to feel less negative about the picture by attending to the picture and trying to change the meaning of it. That means you think of something to tell yourself about the picture that helps you feel less negative about it. So, for example, you could tell yourself something about the outcome, so that whatever is going on will soon be resolved or that help is on the way. You could also focus on a detail of the situation that may not be as bad as it first seemed. But we want you to stay focused on the picture and not think of random things that make you feel better, but rather to change something about the picture that helps you to feel less negative about it. Once again, keep focusing on the picture but tell yourself something about the picture that makes you feel less negative about the picture.

Order of strategy training was counterbalanced. Participants then had eight practice trials: Four were chosen by the experimenter (both strategies at each intensity) and four were freely chosen by participants. In order to ensure that participants understood and adhered to regulatory instructions, participants talked out loud as they implemented their chosen strategies during the training and practice trials. Whenever needed, participants were corrected by the experimenter.

[1] The codes of the IAPS images used in each emotional intensity category are as follows: LOW INTENSITY: 1110, 1275, 1301, 2130, 2205, 2278, 2312, 2399, 2457, 2490, 2590, 2691, 2700, 2722, 2753, 6000, 6010, 6190, 6200, 6211, 6834, 6836, 6840, 7360, 9041, 9102, 9120, 9160, 9190, 9230, 9403, 9404, 9421, 9429, 9440, 9445, 9470, 9471, 9480, 9530; HIGH INTENSITY: 1050, 3000, 3010, 3015, 3053, 3060, 3061, 3062, 3063, 3064, 3068, 3069, 3071, 3080, 3100, 3101, 3102, 3110, 3120, 3130, 3140, 3150, 3168, 3170, 3261, 3266, 3400, 9040, 9181, 9182, 9252, 9253, 9400, 9410, 9921. Five additional high intensity pictures were selected from a different picture set used previously (e.g., McRae et al., 2010).

In each trial of the regulation choice phase (see Figure 1 for general trial structure), participants received a 500-ms preview presentation of the picture. Following this initial presentation, participants chose between reappraisal and distraction by pressing a right or left button. Response key mappings were counterbalanced across participants. Participants then implemented their chosen strategy while viewing each picture for 5,000 ms, and they were videotaped to assess whether they viewed the picture the whole time. To heighten the salience of our instruction to base regulatory choices on their impact on emotional responses (see below for how monetary incentives were also made salient in Study 1), following each trial, participants also rated how negative they felt on a 9 point Likert scale (1 = *not negative at all*; 9 = *very negative*). Note that self-report ratings are not discussed further, because they are uninterpretable with regard to differential effectiveness of using distraction and reappraisal under different emotional intensities. Because participants freely choose between reappraisal and distraction, and because participants strongly prefer to reappraise low-intensity stimuli and distract high-intensity stimuli, the emotional content and its intensity are not held constant across the two regulatory conditions.

Monetary incentive. Monetary incentives were presented on every trial, below each regulatory choice option. Within each emotional intensity category, in half of the trials participants were offered more money to distract, and in half of the trials they were offered more money to reappraise. In addition, within each regulation option, half of the trials involved a small magnitude difference (i.e., offering $ 8.10 for one option vs. $8.50 for a second option), and half of the trials involved a large magnitude difference (i.e., offering $ 8.10 for one option vs. $10.50 for a second option). This equal distribution of trials across conditions was necessary to avoid biasing participants toward preferring a certain regulatory option. To ensure that participants treated the money options in a realistic rather than hypothetical way, we truthfully informed participants that at the end of the experiment, one trial would be randomly selected, and the amount of money that they chose would be added to their initial base rate (see Reynolds, 2006, for a discussion).

To help ensure that participants would implement the strategies they indicated choosing, we reminded participants that the honor code was in effect and that they should implement the strategy they indicated choosing (see Shu, Gino, & Bazerman, 2011, for a demonstration of how reminding participants of the honor code reduces dishonest behavior). To encourage participants to consider both options, during the practice phase, participants were told to choose in each trial after considering both the strategy they prefer to implement in order to reduce negative emotional reactions and the money amounts offered. Specifically, participants were told:

> On some trials, we will offer more money for reappraising; on other trials, we will offer more money for distraction. On every trial, remember that there is no right or wrong answer—your choice of strategy depends entirely on your preferences! That is, you should make your choice for each picture according to the strategy you prefer to do and according to the amount of money offered.

Participants were additionally told that we would be able to know whether they chose only on the basis of one dimension, but they were told they were free to weigh each of these factors as they wished.

Results and Discussion

As predicted, we found that money had an influence on people's choices. When participants were offered more money to distract, they distracted more, and this effect was greater in the high- than low-magnitude condition. Similarly, when participants were offered more money to reappraise, they reappraised more, and this effect was greater in the high- than low-magnitude condition. This effect was demonstrated in a significant interaction between valuable regulation option (reappraisal = more $, distraction = more $) and magnitude (low, high), $F(1, 19) = 13.52$, $p < .01$, $\eta_p^2 = .42$.

Importantly, as can be seen in Figure 2, even though money did influence participants' preferences, under relative low-emotion intensity, participants in general preferred to reappraise (even when given more money to distract), and under relative high-emotion intensity, participants in general preferred to distract

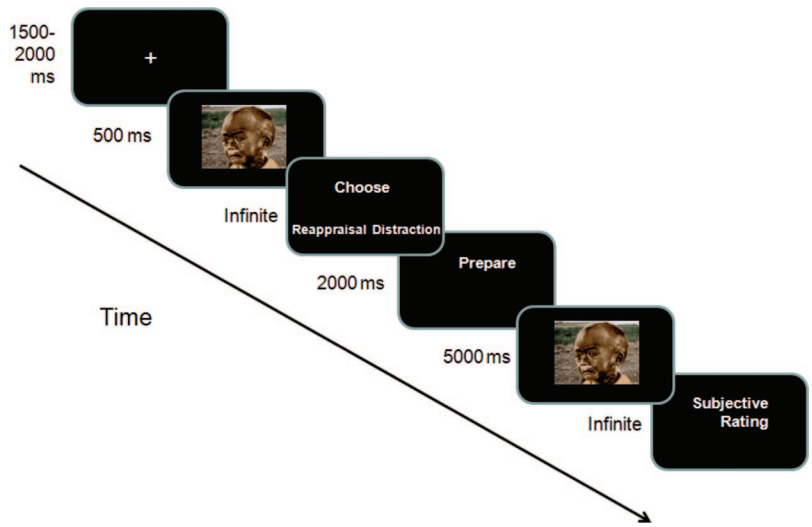

Figure 1. Trial structure of the basic emotion regulation choice paradigm.

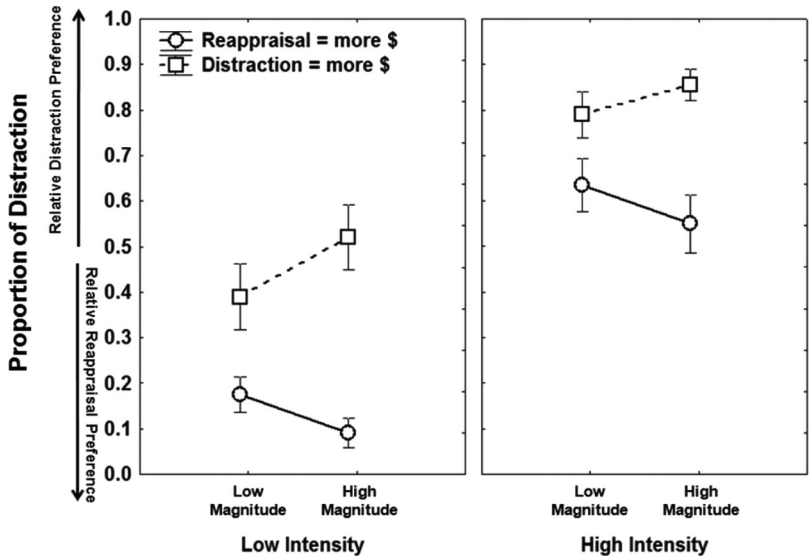

Figure 2. Study 1: Proportion of distraction choice for emotional intensity (low, high), valuable regulation option (distraction, reappraisal), and payment magnitude (small, big). Bars represent standard error of the mean.

(even when given more money to reappraise), $F(1, 20) = 47.51$, $p < .00001$, $\eta_p^2 = .71$. Furthermore, even when participants were offered a high monetary magnitude to distract relative low-intensity stimuli, they still chose to reappraise 48% ($SE = 7.1\%$) of the time, and when participants were offered a high-monetary magnitude to reappraise relative high-intensity stimuli, they still chose to distract 55% ($SE = 6.3\%$) of the time. This significant emotion intensity main effect was not qualified by higher order interactions (all Fs < 3.07, ps $> .09$).

This study permits two major conclusions. First, we were able to show that external incentive functions as a potent reinforcer that is capable of shifting people's regulatory preferences. Specifically, when a certain regulatory option was offered more money, there was an increase in choosing this option with a stronger influence in the high-magnitude condition. Second, and more importantly, the inability of money to reverse participants' preference to reappraise relative low-emotional intensity stimuli and distract relative high-emotional intensity stimuli provides compelling evidence for the robustness of people's regulatory preferences under differential emotional demands.

Study 2

Testing Cognitive Determinants of Regulation Choice

Emotion regulation may be viewed as being composed of several sequential cognitive processes that include generation, implementation, and maintenance (Kalisch, 2009; Ochsner & Gross, 2008). Generation involves finding an adequate regulatory option that will function as an alternative to the original emotional stimulus. The generation process of different regulatory strategies can vary in complexity. Because the generation process precedes the implementation of a chosen strategy, generation complexity is an important factor that likely affects the choice process.

In our account, distraction involves an early attentional disengagement from emotional processing via the production of unrelated neutral thoughts. By contrast, reappraisal involves attending to emotional information and only changing it at a late semantic meaning stage. Our account is influenced by classic theories of selective attention that suggest that a late selection modulation is more complex than an early selection modulation because in the former, more information is gathered about the stimulus prior to the late modulation (e.g., Pashler, 1998). Specifically in the present case, distraction involves generating relatively simple and unrelated alternatives to the emotional information stream (e.g., thinking of simple geometric shapes or of performing daily chores). By contrast, when emotional information is attended, it is followed by a potent appraisal that strongly influences a final response (see Gross & Barrett, 2011, for a review on appraisal theories of emotion). Therefore, the generation of an alternative reappraisal has to compete and override an original potent emotional appraisal.

Recent supporting electrophysiological (Thiruchselvam et al., 2011) and neuroimaging studies (e.g., Kanske, Heissler, Schonfelder, Bongers, & Wessa, 2011; McRae et al., 2010) have shown that distraction blocks emotional processing at an early attentional stage and that reappraisal only modulates emotional processing after an emotional appraisal has been formed and undergone some elaboration. These findings are consistent with the idea that the generation process in reappraisal is more complex than in distraction.

If one of the factors governing emotion regulation choice is the relative complexity of the generation stage of two candidate emotion regulation strategies, simplifying the generation process should increase reappraisal choice. To test this possibility, two groups of participants chose between reappraisal and distraction. One group generated the regulation strategies for themselves (*self-generated group*, who received instructions that were identical to those described in the General procedure of Study 1 and to Shep-

pes et al., 2011, thus functioning as a replication to our basic emotion intensity findings). For a second group, we generated both regulatory options (*experimenter-generated group*). These participants were still asked to choose between strategies, but they were instructed to implement the specific reappraisal or distraction that the experimenter had generated for them.

Method

Participants. Thirty participants (15 women) participated in the study for course credit or monetary compensation. Three participants were excluded from all analyses due to failure to comply with instructions.

Stimuli. We used a set of 30 emotional pictures,[2] including 15 relative low-intensity pictures (mean arousal = 4.99, mean valence = 3.41) and 15 relative high-intensity pictures (mean arousal = 6.02, mean valence = 2.01). Relative low-intensity pictures were significantly different in their IAPS normative values of valence and arousal dimensions from relative high-intensity pictures (both Fs > 10.35, ps $< .01$). At the same time, pictures had similar diverse content and were relatively similar in valence and arousal to the pictures used in Study 1.

Procedure. The procedure was identical to the General procedure of Study 1 except for the following changes. To help limit experimental demand, we used a between-subject design. For the participants in the experimenter-generated group, in each trial, participants saw beneath the two regulation choice options a short description of a generated distraction and reappraisal. Participants were still instructed to freely choose between both strategies, but they were instructed to implement their chosen strategy as written. The distractions and reappraisals we created were based on dominant and frequent responses participants gave for these pictures in previous studies (e.g., Sheppes et al., 2011, Study 2). Specifically, the distraction options we provided for participants involved concrete examples of generic categories that constitute very common daily chores (e.g., "Think about taking a shower") and experiences (e.g., "Imagine yourself climbing up the stairs") in people's lives. Similarly, the reappraisal options also involved concrete examples of generic categories that people frequently use in daily life such as a potential for improvement (e.g., "She is alive and medics are on the scene to help her") or finding deeper meaning ("This woman saved her son by scarifying her life"). This procedure was carried out in an effort to provide distraction and reappraisal options that do not vary in personal relevance. Note that we provided regulatory descriptions for both strategies in an effort to obscure our hypothesis of increased reappraisal preference.

Results and Discussion

As predicted, we found that facilitating the generation process increased the choice of reappraisal. Specifically, in the experimenter-generated group, participants generally chose reappraisal 61.0% (SE = 2.3%) of the time, relative to the self-generated group, who chose reappraisal 54.4% (SE = 2.1%) of the time, $F(1, 26) = 4.24$, $p < .05$, $\eta_p^2 = .14$. This increase in reappraisal choice was found across the relative low- and high-emotional intensity, as there was no indication of a Group × Emotional Intensity interaction, $F(1, 26) < 1$. It bears noting that in both groups, we replicated the emotional intensity main effect, according to which participants distracted more (or reappraised less) under relative high-emotional intensity relative to relative low-emotional intensity, $F(1, 26) = 47.7$, $p < .00001$, $\eta_p^2 = .65$.

The results of this study demonstrate the importance of one cognitive determinant of emotion regulation choice, namely, the complexity of generating distraction versus reappraisal. Specifically, our results show that when the generation process is facilitated for participants, they choose reappraisal more frequently. These results suggest that when individuals consider which strategy to use for a given emotional stimulus, their decisions are influenced by how complex it is to generate each of the two regulation strategies.

Study 3

Testing Motivational Determinants of Regulation Choice

Emotion regulation strategies can be applied to achieve one of two major motivational goals (see Tamir, 2009, for a review). *Hedonic regulatory goals* refer to a motivation to engage in emotion regulation in order to feel less negative or more positive in the near or immediate term. *Instrumental regulatory goals* involve a motivation to engage in emotion regulation in order to achieve one's long-term goals. In some situations, such as when one will not encounter an emotional stimulus again, the only motive that is relevant is the hedonic motive, which aims for achieving short-term relief. At other times, however, if emotional stimuli will be encountered again, the instrumental motive that aims for long-term adaptation is likely to become relevant.

According to our conceptual framework, distraction, which involves early disengagement from emotional information before it is represented and processed in working memory, offers short-term relief, but it results in an unchanged response to repeated encounters of the same emotional situation. By contrast, reappraisal, which involves engagement with emotional information and reinterpretation of it, is well suited for long-term adaptation of emotional stimuli that are encountered multiple times (Kross & Ayduk, 2008; Thiruchselvam et al., 2011; Wilson & Gilbert, 2008).

In the present study, we manipulated types of goals by instructing one group of participants to choose according to the strategy that would make them feel less negative while seeing the picture (the immediate hedonic goal, which also functions as a replication to Sheppes et al., 2011). A second group was instructed to choose the strategy that would make them feel less negative when they encountered the same stimulus again without an option to regulate it. Our expectation was that activating the longer term instrumental goal would increase participants' choice of reappraisal.

Method

Participants. Twenty-two participants (13 women) participated in the study for course credit or monetary compensation.

[2] The codes of the IAPS images used in each emotional intensity category are as follows: LOW INTENSITY: 1110, 1275, 2590, 2722, 2753, 6200, 6211, 6840, 9041, 9190, 9230, 9404, 9471, 9480, 9530; HIGH INTENSITY: 2205, 3010, 3051, 2101, 3110, 3170, 3350, 6212, 6350, 6415, 9040, 9253, 9265, 9400, 9921.

Stimuli. In this study, we used 30 pictures[3] that were different from those used in Study 2 but had similar intensity levels. Specifically, participants made regulatory choices to 15 relative low-intensity pictures (mean arousal = 5.01, mean valence = 3.41) and 15 relative high-intensity pictures (mean arousal = 6.12, mean valence = 1.99). Pictures were significantly different in the normative IAPS ratings on valence and the arousal dimensions (both Fs > 19.01, ps $< .001$). Following the regulation choice phase, all participants viewed all the pictures again with the instruction to simply watch each picture naturally (without engaging in regulation).

Procedure. The procedure was identical to the General procedure described in Study 1 except for the following changes: Participants were randomly assigned to one of two conditions. In the *immediate goal condition*, participants were told to consider for each picture both strategies and pick the one that would make them feel less negative. In the *long-term goal condition*, participants were told that they would encounter all pictures again later in the study and that in the subsequent viewing, they would be asked to naturally watch pictures.

Results and Discussion

As expected, we found that forming a long-term motivational goal increased reappraisal choice. Specifically, in the long-term group, participants chose reappraisal 62.3% (SE = 2.8%) of the time, relative to the immediate goal group, who chose reappraisal 52.5% (SE = 2.5%) of the time, $F(1, 20) = 6.91$, $p < .02$, $\eta_p^2 = .26$. This increase in reappraisal choice was found across the relative low- and high-emotional intensity, as there was no indication of a Group × Emotional Intensity interaction, $F(1, 20) < 1.31$, *ns*. In both groups, we replicated the emotional intensity main effect, such that participants distracted more under relative high-emotional intensity relative to low-emotional intensity, $F(1, 20) = 158.3$, $p < .000001$, $\eta_p^2 = .89$.

This study revealed that when individuals have a goal to improve their mood in the short term, they predominantly reappraise low-emotional intensity stimuli and distract high-emotional intensity stimuli. Importantly, reappraisal choice increases when individuals assume they will have more than one exposure to an emotional stimulus and are given a goal to improve their mood in the long term. The fact that the goal was manipulated between subjects and that participants were aware of only one type of goal mitigates (but does not completely eliminate) concerns about demand characteristics.

Consistent with our framework, distraction seems to be preferred when the aim is short-term relief, but strategies like reappraisal are increasingly preferred when the aim is long-term affective adaptation, which requires attending to and understanding emotional events.

Part II

An Underlying Mechanism for Emotion Regulation Choice

In the previous section, we established that emotional (Study 1), cognitive (Study 2), and motivational (Study 3) factors affect individuals' preferences between two regulation strategies that modulate emotional responding at an early attentional stage (distraction) or a late semantic meaning stage (reappraisal). We now turn to the issue of the mechanisms that underlie emotion regulation choice.

According to our framework in some circumstances, a healthy regulatory choice process requires recruiting deliberate executive control processes, which can override competing associative emotional processes. In addition, a central aspect of emotion regulation choice involves evaluating the consequences of employing early attentional *disengagement* from emotional processing (distraction) versus *engagement* with emotional processing prior to late modulation at the semantic meaning processing stage (reappraisal). In the three studies described below, we sought to better isolate the underlying mechanism and the actual weighing process in emotion regulation choice.

Study 4

Does Emotion Regulation Choice Involve Deliberate Executive Control Processes?

Prominent theories of self-regulation have established that the ability to recruit executive control processes in order to restrain drives, urges, and emotions is crucial to adaptive daily functioning (see Hagger, Wood, Stiff, & Chatzisarantis, 2010, for a review). Congruent with these theories, our conceptual account suggests that healthy individuals can recruit deliberate executive control processes that favor the use of engagement reappraisal to regulate relative low-emotional intensity responses and the use of disengagement distraction to regulate relative high-emotional intensity responses. However an alternative—and potentially more parsimonious— *associative emotional process* account would argue that the regulatory choice preference we obtained is determined directly by a basic defensive motivation system (e.g., Bradley, Codispoti, Cuthbet, & Lang, 2001). This associative emotional process account would argue that as negative emotional intensity increases, it directly activates a basic defensive system to shift from preference to engagement (or sensory intake) to a preference to disengagement (or sensory rejection), which may result in an increased preference to distract. This account is highly parsimonious, as it requires only the operation of a low-level emotion-generation process to predict regulation choice.

It is difficult to distinguish between these two accounts in a *negative* emotion context, because both predict the same outcome (i.e., reappraisal preference for low-intensity negative stimuli, and distraction preference for high-intensity stimuli). However, consider the case of down-regulation of *positive* (appetitive, desirable) stimuli. In general, the requirement to down-regulate emotions in situations that naturally induce positive feelings is more common than one would initially think. Specifically, restraining sexual desires is important for adequate interpersonal behavior (e.g., Gailliot & Baumeister, 2007), controlling food cravings is key to a healthy diet (e.g.,

[3] The codes of the IAPS images used in each emotional intensity category are as follows: LOW INTENSITY: 1301, 2278, 2312, 2490, 2691, 2700, 6010, 6190, 6836, 7360, 9102, 9120, 9160, 9440, 9470; HIGH INTENSITY: 2053, 2800, 3000, 3068, 3140, 3150, 3180, 3230, 3261, 3530, 6831, 9181, 9252, 9410, 9420.

Hill & Weaver, 1991), and even controlling excitement when your baseball team is winning may prove useful when surrounded by fans of the other team. In addition, although most previous studies have concentrated on the regulation of negative emotions, some recent studies have shown that cognitive emotion regulation strategies operate in fairly similar ways resulting in a reduction of subjective experience of positive emotions (e.g., Gruber, Harvey, & Gross, 2012) as well as modulation of electrocortical components that denote positive emotional processing (e.g., Krompinger, Moser, & Simons, 2008). Importantly for the present focus, the two accounts diverge in their predictions when down-regulation of positive stimuli is concerned.

According to an associative emotional process account, positive situations activate the appetitive motivation system, and the organism should choose to engage to a greater degree as emotional intensity increases (e.g., Bradley, Codispoti, et al., 2001). Although Study 1 (in which monetary incentives were used) has some bearing on this point, the valuation of external monetary rewards is achieved at least partially by secondary higher order processes. Therefore, the positive emotional pictures used in this study are from a better representative class of stimuli that are evaluated by basic emotion-generative processes. Nevertheless, this single-process prediction is valid only if one can assume that positive stimuli do not recruit a defensive response that serves a different motivational goal to regain a "no affect" homeostatic state, which predicts that an organism would choose to disengage as positive emotional intensity increases.

Existing empirical data seem to favor the recruitment of an appetitive rather than a defensive system during exposure to positive stimuli. Specifically, it was shown, for example, that male participants rate highly positive stimuli (e.g., erotica, attractive different-sex models, and highly arousing stimuli) as more interesting, that they spontaneously watch these stimuli longer, and that these characteristics result in a stronger engagement motivational response in physiological and genital systems relative to low-positive and neutral stimuli (e.g., nurturing, less attractive other-sex members; e.g., Freund, 1963; Imhoff et al., 2010; Lang, Greenwald, Bradley, & Hamm, 1993; Lippa, Patterson, & Marelich, 2010). In addition, recent studies in our lab have asked participants to choose between pairs of emotional images on the basis of participants' desire to watch one of these stimuli for a longer period. Results indicated that most participants clearly preferred to watch high-positive stimuli relative to low-intensity or neutral images (Suri, Sheppes, & Gross, 2012). Therefore, prior research suggests that a single-process account should predict that an increase in positive emotional intensity would result in an increased appetitive motivation to engage.

In the study described below, we had participants make emotion regulation choices for high- and low-positive emotional intensity stimuli. Although the associative emotional process account predicts an increased engagement reappraisal preference as emotional intensity increases, our *deliberate executive control process* account suggests that underlying mechanisms of regulatory options and their consequences are weighed, and thus it predicts more disengagement choice, which blocks emotional processing early as emotional intensity increases.

Method

Participants. Twenty-three men completed the study. One participant was excluded from all analyses because he appeared very distracted throughout the study. We only invited men for this study, because in order to elicit high-positive emotion, we had to use (among other stimuli types) erotica stimuli, which induce stronger and less controversial emotional reactions in men than women (Bradley, Codispoti, Sabatinelli, & Lang, 2001).

Stimuli. A total of 34 IAPS pictures[4] with 17 relative low-positive intensity pictures (mean arousal = 4.67, mean valence = 6.41) and 17 relative high-intensity pictures (mean arousal = 6.83, mean valence = 7.26) was used. Relative low-intensity pictures were significantly different in their IAPS normative ratings of valence and arousal from relative high-intensity pictures (both Fs > 18.95, ps $< .001$). Picture content was equated when possible between emotional intensity levels and mainly included erotica, desirable food, and sports scenes stimuli.

Procedure. The general procedure was identical to the General procedure of Study 1 except for the following changes: In this study, participants were told that in many real-life situations, individuals are required to reduce their positive feelings. Participants were given examples regarding sexual desires, food cravings, and sports scenes, which were the pictures that we mainly used in the actual study. In both the reappraisal and distraction options, participants were told that their goal was to try to feel less positive.

Results and Discussion

Consistent with our deliberate executive control process account—but contrary to the associative emotional process account—we found that the preference to choose disengagement distraction became stronger for high-57.1% (SE = 3.0%) relative to low-32.1% (SE = 4.0%) intensity positive pictures, $F(1, 20) = 29.0$, $p < .0001$, $\eta_p^2 = .59$.

Although the implications of the results of the present study are limited to men, these results are important theoretically because they show that under some circumstances, people recruit deliberate executive control processes that would modulate associative emotional processes. These results show that even when a low-level emotion associative system activates an appetitive drive to engage, individuals can override this drive and choose regulatory strategies that are in contrast with the motivational system but in line with the deliberate regulation goal.

Study 5

Is Regulation Choice Mainly Determined by Engagement-Disengagement Considerations or by Differential Effort?

According to our framework, when individuals need to choose between reappraisal and distraction, a major factor is the strate-

[4] The codes of the IAPS images used in each emotional intensity category are as follows: LOW INTENSITY: 2025, 4000, 4601, 4606, 4609, 4610, 4624, 5830, 7284, 7285, 8120, 8311, 8320, 8420, 8465, 8497, 8531; HIGH INTENSITY: 4210, 4290, 4659, 4664, 4681, 4800, 4810, 5621, 5629, 7330, 7350, 8030, 8179, 8185, 8186, 8191, 8400.

gies' underlying operation and their consequences. Consider the robust effect of emotional intensity on regulation choice (Sheppes et al., 2011; Studies 1, 2, and 3). According to our account, under relative low-emotional intensity, individuals prefer reappraisal, because they prefer to engage with emotional processing and to modulate emotional processing at a late semantic meaning stage, which proves successful in both the short- and long run. By contrast, under relative high-emotional intensity, individuals prefer distraction because they prefer disengaging attention early, which successfully blocks emotional processing before it gathers force (Sheppes & Gross, 2011; Sheppes & Meiran, 2007; Thiruchselvam et al., 2011).

Although the weighing of the engagement-disengagement dimension in regulatory choice appears to be important, it is also necessary to consider the possible role of differential cognitive effort involved in implementing reappraisal versus distraction. Specifically, distraction is considered a regulatory strategy that requires less cognitive effort relative to reappraisal, especially when dealing with potent emotional response tendencies (e.g., Sheppes et al., 2009; Sheppes & Meiran, 2008; see also Sheppes & Gross, 2011, for a review). Accordingly, it may be that in high-intensity situations, individuals prefer distraction over reappraisal mainly because distraction requires less cognitive effort than reappraisal.

There are good reasons to predict that in relative high-intensity situations, individuals would prefer to base their decision on the less effortful regulatory option. Several theoretical accounts argue that highly stressful/threatening situations deplete available resources, leading effortful regulatory options to become unavailable or undesired (see Chajut & Algom, 2003; Muraven & Baumeister, 2000, for reviews). Furthermore, a recent influential account has shown that across many decision-making situations, individuals show a strong preference to minimize cognitive effort (Kool, McGuire, Rosen, & Botvinick, 2010). According to this view, individuals prefer to use distraction under high-emotional intensity mainly because distraction is less effortful than reappraisal.

In our previous studies, the distraction condition was both more disengaging and less effortful than reappraisal. Therefore, to evaluate the relative contribution of engagement-disengagement and the minimization of effort in this study, we provided a strong challenge to our account by testing whether participants would still show a preference to use a more disengaging regulatory distraction even when it was clearly more effortful. In addition, because different regulation strategies such as reappraisal versus distraction differ on many different dimensions, in this study, we had participants choose between two options of the same (distraction) regulation category. Specifically, in both distraction options, we had participants perform a series of mathematical subtractions that varied in cognitive effort. One option involved subtracting 2s and another involved subtracting 7s. Previous studies have shown that performing mathematical operations functions both as a common distraction from processing emotional information and as a classic way to manipulate cognitive effort (e.g., Erber & Tesser, 1992; Van Dillen & Koole, 2007).

The characteristics of this study make it possible to evaluate the centrality of minimization of effort and engagement-disengagement. Specifically, if individuals mainly prefer to minimize their effort especially when faced with high-intensity stimuli, their preference to choose the less effortful subtract 2 option should become stronger for high- relative to low-intensity stimuli. If individuals mainly choose on the basis of engagement-disengagement considerations, their preference to choose the more effortful (yet highly disengaging) subtract 7 option should become stronger for high- relative to low-intensity stimuli.

Note that central to our account is the notion that although the subtract 7 option is more effortful, it also more strongly allows disengagement from emotional processing relative to subtract 2. In line with this view, recent findings show that inducing high- relative to low-cognitive load in working memory (which involves high-cognitive effort) provides stronger disengagement or modulation of neural emotional processing (e.g., Erk, Kleczar, & Walter, 2007; Pessoa, McKenna, Gutierrez, & Ungerleider, 2002; Van Dillen, Heslenfeld, & Koole, 2009). Complimentary to this finding, Van Dillen and Koole (2007) have also shown that high- relative to low-working memory load is more effective at modulating high-intensity emotional stimuli.

In order to directly estimate *cognitive effort* and *emotional modulation* in our study, we evaluated participants' actual mathematical performance in the different conditions. Specifically, we measured how many mathematical operations participants performed for each regulatory option (subtract 2, subtract 7) and for each emotional intensity level (low, high). We expected that in general, relative high-intensity stimuli would capture more attention and thus would result in less mathematical operations performed relative to low-emotional intensity. Importantly, to show differential cognitive effort, we expected participants to generally perform fewer operations for subtract 7 relative to subtract 2. To show emotional modulation, we predicted that mathematical performance in a more disengaging regulatory option would be less affected by the intensity of the emotional stimulus that is presented. Therefore, we expected that the drop in mathematical performance when relative high- versus low-intensity stimuli are presented would be *smaller* for the (highly disengaging) subtract 7 option relative to the (mildly disengaging) subtract 2 option. Although counterintuitive, our underadditive interaction prediction, in which the performance in the effortful task (subtract 7) is less affected relative to the low-effortful task (subtract 2) in the demanding high-emotional intensity condition, has previously been demonstrated (e.g., Erk et al., 2007).

Method

Participants. Twenty-nine participants (19 women) participated in the study. Three participants were excluded from all analyses. One participant had to leave before completing the study, and the other two participants failed to comply with instructions.

Stimuli. The emotional pictures used were identical to those used in Study 3.

Procedure. The procedure was identical to the General procedure of Study 1 except for the following changes: The actual practice involved training people in subtracting 2s and 7s and then practicing choosing between these options. In every trial, after participants chose their strategy in the prepare screen, they were given a two-digit number they should subtract from. Participants were told to keep subtracting until the picture was off the screen. On the basis of pilot testing for this study, we extended the picture duration (and hence strategy implementation) from 5 to 10 s in order to allow participants to perform enough computations to

estimate performance. Following picture presentation, participants entered the number that they reached and continued to the next trial. We wanted to minimize the situation in which participants reach a number smaller than zero, and we also did not want the first 7 subtraction to be an easy one. Therefore, based on piloting, the numbers participants were given were between 51 and 99, with the exception that the units digit is not 0 or 7. Lastly, as in our previous experiments, we instructed participants to choose in each trial on the basis of which option would make them feel less negative, and we further mentioned that although we wanted them to do their best on the math, we were not testing math abilities.

Math task. We estimated cognitive effort and emotional modulation by looking at the number of mathematical computations participants performed for each emotional intensity level (low, high) and each strategy option (subtract 2, subtract 7). Number of mathematical computations was calculated by subtracting the number participants reached at the end of each trial from the number participants received in the beginning of each trial and dividing the total by participants' choice in each trial (2 or 7). For this measure, we only used correct responses (i.e., where the resultant number had no residual). Complimentary to the number of mathematical operations measure, we also separately evaluated participants' accuracy by computing the proportion of correct responses (proportion of instances when the resultant number had a residual). This additional measure was included to check whether differences in the number of mathematical operations are due to a change in participants' response criterion (i.e., speed–accuracy trade-off: where participants emphasize responding more accurately over responding quickly) rather than actual performance.

Results and Discussion

Strategy choice. Supporting our conceptual framework—but not the minimization-of-effort account—we found that the preference toward the more effortful yet highly disengaging subtract 7 option became stronger for high-52.6% (SE = 5.26%) relative to low-32.5% (SE = 5.26%) intensity stimuli, $F(1, 25) = 6.93$, $p < .02$, $\eta_p^2 = .22$.

Math performance. As predicted, differential cognitive effort was demonstrated in finding that participants generally performed fewer mathematical operations, $F(1, 20) = 50.62$, $p < .00001$, $\eta_p^2 = .72$, and were less accurate, $F(1, 21) = 18.26$, $p < .001$, $\eta_p^2 = .47$, in the subtract 7 option relative to the subtract 2 option (see Figure 3a and 3b). Importantly, our *emotional modulation* prediction, which argues that mathematical performance in the highly disengaging subtract 7 option is less affected by emotional intensity relative to the mildly disengaging subtract 2 option, was also supported. Specifically, we found a significant two-way interaction between emotional intensity (low, high) and regulation strategy (subtract 2, subtract 7), where the drop in the number of mathematical operations performed in the relative high- versus low-intensity stimuli was smaller for the highly disengaging subtract 7 option relative to the mildly disengaging subtract 2 option, $F(1, 20) = 4.79$, $p < .05$, $\eta_p^2 = .19$ (see Figure 3a). This is unlikely to be the result of a floor effect in the subtract 7 option, because the number of mathematical operations in the low- and high-emotional intensity conditions was significantly higher than zero (both ts > 3.33, ps < .00001).

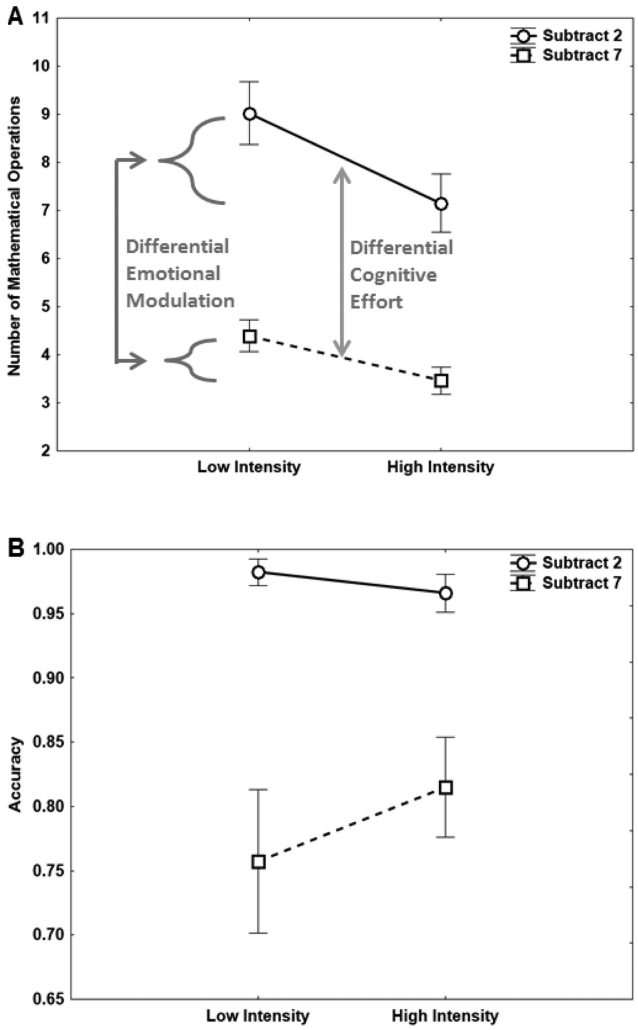

Figure 3. Study 5: A: Number of mathematical operations and B: accuracy (percent correct) by emotional intensity (low, high), and strategy chosen (subtract 2, subtract 7). Bars represent standard error of the mean.

In order to see whether this difference in mathematical performance was due to participants' change in response criterion, we separately evaluated accuracy. The complimentary two-way interaction between emotion intensity and regulation strategy was marginally significant, $F(1, 21) = 2.87$, $p = .10$, $\eta_p^2 = .12$. Although we are hesitant to interpret a nonsignificant result, the trend of this interaction is consistent with our disengagement hypothesis and in contrast with a speed–accuracy trade-off trend. Specifically, the trend in means showed that for the subtract 2 option, there was a small decrement in performance in the high- versus low-intensity condition, and for the subtract 7 option, there was actually a slight improvement (see Figure 3b).

The results of this study are important because the preference to disengage and block emotional processing early under high intensity was observed even when the more disengaging option was clearly more effortful (see also Kessler, Shencar, & Meiran, 2009, who showed that individuals spontaneously prefer to switch from an easy to effortful task). We do not argue that cognitive effort

does not play any role in determining regulation choice; however, the present finding likely underestimates the centrality of the engagement-disengagement dimension, because the subtract 7 condition used in this study is highly demanding and effortful. In line with this view, findings from Studies 1, 2, and 3 show that, in general, participants choose reappraisal (the effortful option) more than the easier option (distraction). Therefore, these results suggest that under relative high-emotional intensity, individuals are not depleted or unmotivated to perform effortful tasks and thus retreat to use easier regulatory options.

Furthermore, in this study we showed that the subtract 7 option is highly disengaging by demonstrating that actual mathematical performance is less affected by emotional intensity relative to a mildly disengaging subtract 2 option. According to our account, the subtract 7 option is an effortful disengaging regulatory option involving high-working memory load that blocks emotional information from being processed and thus affecting actual mathematical performance to a lesser extent relative to the mildly disengaging subtract 2 option (see also Erk et al., 2007; Pessoa et al., 2002; Van Dillen et al., 2009).

Finally, by letting people choose between two regulatory options of the same (distraction) strategy, we have shown that the engagement-disengagement dimension is not exclusive to comparisons between reappraisal versus distraction. This result is important as it helps ruling out alternative interpretations of differential choice preferences when contrasting two strategies that differ in more than one dimension.

Study 6

Underlying Mechanism in Regulatory Choices of Different Types of Reappraisal

The goal of this study was to provide empirical evidence for the importance of engagement/disengagement in regulatory choices that involve late semantic meaning selection—reappraisal. In general, reappraisal is considered an engagement regulation strategy. Nevertheless, changing the semantic meaning of an emotional event via cognitive reappraisal can be achieved in more than one way (see McRae, Ciesielski, & Gross, 2012; Ochsner & Gross, 2008, for reviews).

In the studies we have presented thus far, we have concentrated on a type of situation-focused reappraisal in which the meaning of ongoing events is reinterpreted (Moser, Most, & Simons, 2010; Ochsner et al., 2004). We have chosen this focus because we have wanted to provide a clear contrast term to disengagement distraction. In the present study, we wished to use the recent elaborations put forth by McRae and colleagues (2012) and contrast our engagement situation-focused reappraisal with another situation-focused reappraisal that is considered more disengaging to test whether the engagement-disengagement dimension we have previously identified is central in regulatory decisions that involve late selection emotional processing modulation.

More specifically, we contrasted our original engagement reappraisal option with a second situation-focused "reality challenge" reappraisal in which the emotional situation is construed as fake or not real (e.g., McRae et al., 2012). Whereas engagement reappraisal involves understanding and elaborating on emotional consequences in order to change them, in reality challenge reappraisal, disengagement is apparent because consequences are simply not considered, and the basic authenticity of the event is being questioned.

On the basis of our account, we predicted that the preference for the more disengaging reality challenge would increase for high- relative to low-emotional intensity stimuli. However, prior to conducting the main study, it was important to provide converging evidence for findings from Study 5 by showing that the preference to choose reality challenge under high-emotional intensity relative to low-emotional intensity is not mainly driven by effort considerations. Specifically, if, on average, high-emotional intensity images seem less real than low-emotional intensity images, a stronger preference to choose reality challenge for high-emotional images may reflect preference for the less effortful option rather than a preference for the more disengaging option.

To that end, we ran a preliminary study with 18 Hebrew-speaking participants (14 women) from Tel Aviv University who participated in the study for course credit (materials were translated from English by G. S., who is fluent in both languages). In a first stage, participants were trained to form reality challenge reappraisals. In the actual study, participants were shown 30 images (15 relative high- and 15 relative low-emotion intensity images identical to those used in Studies 3 and 4 and to the main study described below). In each trial, participants were asked to make a reality challenge reappraisal, followed by a rating of how effortful was it to think that the picture was fake or staged (1 = *not at all*; 9 = *very effortful*). Results indicated that forming reality challenge reappraisals for high-emotional intensity images (M = 4.48, SE = 0.36) was significantly more effortful relative to low-emotional intensity images (M = 2.94, SE = 0.22), $F(1, 17) = 20.07$, $p < .001$, $\eta_p^2 = .54$, with 89% of our sample (16/18) showing this trend. Therefore, demonstrating in the main study that the preference toward reality challenge reappraisal would increase for high- relative to low-intensity images would support an increased preference to disengage from emotional processing despite increased effort.

Method

Participants. Eighteen German-speaking participants (14 women) from the University of Salzburg participated in the study for course credit.

Stimuli. The emotional pictures used were identical to those used in Studies 3 and 4.

Procedure. Materials were translated from English by J. B., who is fluent in both languages and who is experienced in conducting emotion regulation studies. The General procedure was identical to Study 1 with the exception that reality challenge was used instead of distraction. Specifically, following McRae et al. (2012), participants were taught to view emotional pictures as fake or staged (e.g., Hollywood makeover).

Results and Discussion

Consistent with our engagement-disengagement prediction, we found that the preference to choose the disengaging reality challenge reappraisal became stronger for relative high-65.9% (SE = 3.1%) relative to low-35.6% (SE = 3.6%) intensity pictures, $F(1, 17) = 33.99$, $p < .0001$, $\eta_p^2 = .67$.

The results of the present study lend further support to the premise that the underlying mechanism for the switch in regulation choice preference when facing relative low- versus high-intensity stimuli is the engagement-disengagement dimension. Specifically, we have shown that holding the regulation strategy constant (reappraisal) while manipulating the level of engagement/disengagement resulted in greater preferences for the engagement reappraisal type when faced with relative low-emotional intensity stimuli and the disengagement reappraisal type when faced with relative high-intensity stimuli. These results were obtained despite findings from a preliminary study showing that participants rated that it was more effortful to form reality challenge under high- relative to low-intensity stimuli. Together, the results of Studies 5 and 6 suggest that our previous regulation choice preference results with reappraisal and distraction may be best explained by the underlying engagement-disengagement dimension.

General Discussion

One domain of choice behavior that is vital to general functioning and yet virtually unexplored is the regulation choices individuals make to control their emotional environment (Kashdan & Rottenberg, 2010). Building on our new conceptual framework (Sheppes & Gross, 2011, 2012), we sought to provide and test a systematic account of emotion regulation choice.

Our first goal was to provide a more complete test of our account by evaluating core emotional, cognitive, and motivational determinants of emotion regulation choice (Studies 1–3). Specifically, in Study 1, the robustness of the effect of emotional intensity on regulatory choice was demonstrated in finding that the tendency to reappraise relative low-intensity stimuli and to distract relative high-intensity stimuli (Sheppes et al., 2011) was preserved even when participants were offered money to choose differently. In Study 2, a cognitive determinant of regulation choice was demonstrated in finding that facilitating the generation of regulation strategies resulted in an increased preference for reappraisal, which naturally involves a complex cognitive-generation process relative to distraction. In Study 3, a motivational determinant of regulation choice was demonstrated in finding that activating long-term goals increased reappraisal choice, which offers enduring adaptation via attending and providing alternative meaning to emotional events.

Our second goal was to clarify the mechanisms underlying the observed regulatory choice preferences (Studies 4–6). Specifically, Study 4 supported our conceptual account by showing that emotion regulation choice can be executed by deliberate executive control processes that can inhibit opposing associative emotional rewarding drives. Studies 5 and 6 showed that regulation choice mainly involves evaluating whether to engage with or disengage from emotional processing, and not general cognitive effort or other considerations that are inherent when choosing between two different regulatory options.

Implications for Emotion Regulation

Emotion regulation choice provides an important extension to the general field of emotion regulation. Previous studies of emotion regulation have almost exclusively focused on the consequences of implementing different emotion regulation strategies (see Gross, 2007; Koole, 2009, for reviews). Multiple studies have instructed participants to engage with different emotion regulation strategies and examined the costs and benefits associated with successful implementation. Understanding the consequences of using different regulation strategies is a crucial and important step toward a basic understanding of the basic elements of emotion regulation strategies. Our emotion regulation choice findings extend this work by illuminating a step that precedes the implementation of emotion regulation. More generally, we would argue that emotion regulatory phenomena can be viewed as involving several important stages (see Webb, Gallo, Miles, Gollwitzer, & Sheeran, 2012, for a related framework).

The first stage is when individuals try to decide their emotion regulation goal in a particular context. Emotion regulation goals may include hedonic considerations where individuals try to minimize the experience and influence of negative emotions and maximize the experience and influence of positive emotions or instrumental considerations that help individuals achieve their long-term goals even if these goals involve experiencing negative emotions or modulating positive emotions (e.g., Tamir, 2009, 2011, for reviews).

The second stage, which we have considered in these studies, occurs after an individual has defined his or her emotion regulation goals. When an emotion regulation goal has been activated, individuals then need to select a regulation strategy out of all the available options. Our conceptual account has highlighted some emotional, cognitive, and motivational factors that can strongly influence the regulatory choices individuals are inclined to make in any particular context.

The third stage is when individuals actually try to implement an emotion regulation strategy in order to achieve a particular emotion regulation goal. The numerous studies concentrating on this stage have clearly showed that there are many different forms of emotion regulation, many of which appear to have quite different affective, cognitive, and social consequences (e.g., Gross & Thompson, 2007).

Additional stages that should also be studied occur following implementation. Specifically, many emotion regulation strategies need to be maintained in an active state over time. Recent conceptual models (Kalisch, 2009) and supporting empirical findings (Paret et al., 2011) suggest that whereas implementation requires selecting the strategy and updating it in working memory, maintenance recruits different processes that involve working memory and performance monitoring.

Implications for Judgment and Decision Making

Classic studies of choice behavior involve deciding between different outcomes to control one's external environment. For example, in intertemporal choice paradigms such as temporal discounting (Reynolds, 2006), individuals choose between monetary incentives that can be realized at different times (e.g., $5 today vs. $6 tomorrow). Other studies involve deciding between different processes to control the external environment such as in mathematical strategies children use to solve math problems (Siegler, 2005) or the strategies adults use to solve chess problems (de Groot, 1978). Emotion regulation choice is a special case of decision making because it involves choosing between cognitive processes to control one's internal emotional environment.

Although emotion regulation choice appears to be unique in some ways, it shares basic assumptions about strategy selection with other theories. Like classic theories in decision sciences (e.g., Payne, Bettman, & Johnson, 1988, 1993), our account holds that a certain set of central factors (emotional, cognitive, and motivational) are likely to bias regulatory selections. In addition, just like other models highlight the role of learning (e.g., Rieskamp, 2006; Rieskamp & Otto, 2006), in our account individuals may base their regulatory decisions on prior knowledge with the consequences of different strategies in different contexts.

Implications for Clinical Science

Psychological well-being is said to require flexibly adapting emotion regulation strategies to fit differing situational demands (Gross, 2007; Kashdan & Rottenberg, 2010; Watkins, 2011). One corollary is that various forms of psychopathology might be characterized by a general restriction of psychological flexibility that results in regulatory reactions that are rigid and maladaptive. The present study adds to these theoretical models by systematically mapping the influence of several central factors on regulatory choice in healthy individuals. Understanding deviations from healthy regulatory choice can be used to understand different forms of psychopathology.

Consider, first, emotional intensity. As we have repeatedly demonstrated, healthy individuals prefer to use reappraisal with low-intensity emotional situations and distraction with high-intensity situations. Deviation from this regulatory preference might be related to different psychopathologies. Specifically, deviation from choosing to disengage from very high-intensity stimuli can be seen in individuals who are prone to develop major depression. According to the response style theory, rumination involves engaging with strong emotional experiences and repeatedly thinking about their causes and consequences in an abstract and repetitive way (e.g., Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 2008, for reviews). Rumination has been proved to be related to onset maintenance and relapse of depression. It is interesting that according to the same theory, a second response style that has been shown to provide an adaptive alternative to rumination when dealing with strong emotional experiences is using positive distractions (e.g., Nolen-Hoeksema & Morrow, 1991, 1993). Emotion regulation choice is likely to be an important target in the context of depression, because empirical studies have shown that depressed individuals are able to effectively implement distraction when instructed to (e.g., Joormann & Siemer, 2004; Joormann, Siemer, & Gotlib, 2007) but that they hold a favorable view of rumination by believing that it helps understanding better the reasons for depressed mood.

A second type of deviation from the regulatory choice pattern healthy individuals show involves diverging from engaging with low-emotional intensity stimuli. Common to several anxiety disorders is a tendency to overgeneralize a disengagement or avoidance regulatory response (see Campbell-Sills & Barlow, 2007; Foa & Kozak, 1986, for reviews). Avoidance usually starts in response to high-intensity emotional stimuli, but over time, it ends up spilling over to seemingly low-intensity stimuli. As pointed in our conceptual model, although disengagement strategies are helpful in providing short-term relief, they are maladaptive in the long run and can perpetuate anxiety and fears.

The second factor we have highlighted is the ease with which a regulation strategy is generated. Specifically, we saw that aiding the process of generating a regulation increased reappraisal choice. This finding may be important, as several types of psychopathologies involve a difficulty with spontaneously thinking differently about situations such as those in which individuals with obsessive-compulsive personality disorder show general rigidity in their thinking (e.g., Mancebo, Eisen, Grant, & Rasmussen, 2005). More broadly, these results bear on most cognitive behavioral therapies where patients are being taught ways to generate effective reappraisals (e.g., Campbell-Sills & Barlow, 2007). Although the final objective is to have patients generate their own regulation strategies, throughout the course of treatment, therapists introduce (or generate) alternative ways in which patients can think about upsetting events, and in this way gradually build patients' skill.

The third factor we have highlighted is the goals individuals have when choosing to regulate their emotions. We have found that forming a goal to provide long-term adaptation to emotional events that repeat leads to increased reappraisal choice. Furthermore, in order to pursue the long-term goal that facilitates choosing to reappraise, one needs to override the short-term goal of experiencing immediate relief via disengagement distraction. Overriding short-term goals in order to pursue long-term goals has been considered as a central feature in healthy adaptation, and impairments in this ability have been linked to various psychopathologies including addictions and eating disorders such as bulimia (see Heatherton & Baumeister, 1991; Vohs & Baumeister, 2011, for comprehensive reviews).

Limitations and Future Directions

In this article, we have provided a systematic account of emotion regulation choice. In doing so, we have evaluated the influence of emotional, cognitive, and motivational determinants and begun to clarify the mechanisms that underlie emotion regulation choice. We believe this framework suggests a number of research directions.

First, we have provided evidence that emotional, cognitive, and motivational factors influence emotion regulation choice. Specifically, we have examined the influence of one emotional (emotional intensity), one cognitive (generation of a strategy), and one motivational (short- vs. long-term goals) determinant of emotion regulation choice. Although these factors appear important, future studies should evaluate the influence of the many additional factors that are likely to influence regulatory preference. To illustrate, consider the fact that availability of cognitive resources is likely to influence individuals' regulatory choices. Specifically, a temporary state of self-control resource depletion (e.g., Muraven & Baumeister, 2000) is likely to lead individuals to prefer strategies like distraction that provide short-term relief. Because self-control has been linked to many important behaviors (e.g., Baumeister, Vohs, & Tice, 2007), including making nonemotional choices (Vohs et al., 2008), studying how additional factors such as how ego depletion affects regulatory choice is an important future research direction.

Second, in the present set of studies, we used pictorial stimuli to induce differing levels of emotional intensity. To induce high-emotional intensity, picture content was somewhat limited with themes that mainly represent threat, human suffering, and mutila-

tions. It is important to note that although the contents of the intense images we used are not encountered on a daily basis, the high prevalence of road accidents and hospital visits make the exposure to such stimuli more frequent. Importantly, increasingly on the Internet and in the media people are exposed to images of the kind we used (e.g., the execution of Gaddafi, or the civil war in Syria). In addition and more generally, although different psychopathologies clearly revolve around specific themes, because the IAPS reliably induces potent emotional experiences, it has been informative in studies with clinical populations whose psychopathology is characterized by intense emotional responses such as anxiety disorders (e.g., Shah, Klumpp, Angstadt, Nathan, & Phan, 2009) and mood disorders (e.g., Johnstone, van Reekum, Urry, Kalin, & Davidson, 2007). Nevertheless, future studies should use multiple emotional contents when evaluating the determinants and consequences of emotion regulation choice.

Third, we have mainly focused on regulatory choices between reappraisal and distraction. Although distraction and reappraisal are considered classic disengagement and engagement strategies (Parkinson & Totterdell, 1999), and although they are widely used in everyday life, studies of choices between other emotion regulation strategies are urgently needed. In everyday life, individuals are not only choosing between distraction and reappraisal but rather from many more regulatory options. In the Clinical Implications section above, we have discussed several emotion regulation strategies individuals with psychopathologies tend to use. To date, however, there has not been a single study in which choice of regulation strategies that are generally considered maladaptive has been evaluated. Specifically, future studies should evaluate the conditions that promote preferring strategies like rumination or suppression, which are at the hallmark of many psychopathologies.

Fourth, the goals of the present study were to generally characterize the influence of different factors on emotion regulatory choice. Findings from this and our recent study (Sheppes et al., 2011) have shown relatively large effect sizes and effects that were observed in the majority of our participants. Nevertheless, it is quite clear that studying individual differences in emotion regulation choice is crucial. Recent relevant studies have shown that individual differences in the ability to modify emotions are tightly linked to long-term adaptation (e.g., Bonanno et al., 2004; Westphal et al., 2010). Therefore, future studies should evaluate how multiple individual differences can moderate the influence of central factors on emotion regulation choice.

Fifth, in our conceptual account, we have suggested that healthy individuals are able to choose between regulatory options in a manner that is congruent with strategies' cost and benefit profiles or with what is considered to be effective. Our findings have also shown that at least in some cases, emotion regulation choice involves recruiting executive control resources that can override competing emotional processes. Nevertheless, multiple demonstrations in general decision-making studies have shown the boundaries of human reasoning and the extensive use of relatively effortless heuristics that do not always lead to optimal outcomes (e.g., Tversky & Kahneman, 1974). Accordingly, future studies should investigate situations in which individuals' regulatory choices are determined by simple heuristics that do not necessarily lead to the best outcome. We believe that in cases in which a certain regulatory option is either very dominant or its adaptive consequences are counterintuitive may lead people to adopt strategies that are not in their best interest. In a related vein, our studies have focused on deliberate and conscious regulatory choices. Although conscious regulation strategies have been a major focus in the field of emotion regulation, and although they are an integral part of daily functioning and many cognitive behavioral therapies targeting emotion dysregulation (e.g., Linehan, 1993), many emotion regulation choices are likely to be determined implicitly and without deliberate control. Similarly, the regulatory weighing process we described may equally be determined implicitly, as multiple studies have impressively demonstrated the complex computations that can be achieved via unconscious goal pursuit (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trotschel, 2001; Williams, Bargh, Nocera, & Gray, 2009).

Finally, our conceptual emotion regulation choice account (Sheppes & Gross, 2011) was originally formulated to explain differences in the effectiveness of implementing emotion regulation strategies. In the present studies, we have demonstrated additional links between certain regulatory choices and outcomes. Nevertheless, future studies should make stronger connections between the developing studies on emotion regulation choice and the well-established studies on the consequences of regulation implementation. For example, studies should evaluate whether the effectiveness of implementing a given strategy is moderated by an ability to override default regulatory choice preferences. At the same time, future studies in emotion regulation choice should use multiple levels of analysis that combine the concurrent assessment of the effectiveness of a chosen regulatory strategy.

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Received February 23, 2012
Revision received October 14, 2012
Accepted October 15, 2012 ■