Better Late Than Never? On the Dynamics of Online Regulation of Sadness Using Distraction and Cognitive Reappraisal

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Real-life emotion regulation often occurs at some point after an emotion-triggering event (ETE) has been introduced, but most previous research has involved regulation before or after the ETE. In a series of experiments, the authors examined online regulation via distraction and cognitive reappraisal by manipulating the strategy initiation point in sadness-evoking films. Distraction was effective even when initiated late, presumably because it involves diluting the ETE contents by mixing them with a nonsad input. By contrast, reappraisal was less effective when initiated late, suggesting a possible point of no return for this strategy: Adopting a detached view late in the ETE may be difficult because it involves continued focus on the ETE and hence requires overcoming a previously formed tendency of identifying with the emotional content.

Keywords: *emotion regulation; sadness; cognitive reappraisal; distraction; point of no return; differential effectiveness*

Suppose a friend sadly announces that she has been diagnosed with terminal cancer. In such a case, you might start preparing to down-regulate sadness before the friend discloses the sad news. Alternatively, you might attempt down-regulating after the friend has finished telling the story. A third possibility, and the one in the present focus, is to start down-regulating sadness sometime after the friend has begun telling her or his story and to continue to do so as the story unfolds. We term this phenomenon *online emotion regulation*—the attempt to change emotion that starts and continuously operates while the emotion-triggering event (ETE) unfolds.

In what follows, we concentrate on the literature of two emotion regulation strategies: *distraction* and *cognitive reappraisal*. As will be shown, previous studies provided only limited, indirect evidence regarding online regulation because they focused on the first two scenarios described in the preceding paragraph. We first describe Gross's (1998b) process model of emotion regulation and its limitations. We then briefly review relevant individual difference studies, followed by experimental studies that manipulated the regulation strategies after the ETE had terminated. Only a few experimental studies include a limited behavioral test of online regulation (Ochsner, Bunge, Gross, & Gabrieli, 2002; Ochsner et al., 2004; Ray et al., 2005).

Gross's Process Model

Gross's (1998b, 2001) process model describes the development of an emotion as a cascade of serial events and classifies emotion regulation strategies by the presumed point of intervention in this cascade. These groups include: (a) situation selection strategies; (b) situation modification strategies; (c) attentional deployment strategies, such as distraction, that take individuals'

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minds off their negative mood and on to pleasant or neutral thoughts or activities (e.g., Nolen-Hoeksema, 1987, 1991); (d) cognitive change strategies such as cognitive reappraisal, which is defined as construing a potentially emotion-eliciting situation in nonemotional terms (e.g., Gross, 2002; Gross & John, 2003; Richards & Gross, 2000); and (e) response modulation strategies. The model divides the five groups of strategies into antecedent-focused strategies (situation selection, situation modification, attentional deployment, cognitive change), which start operating before the response tendencies have been fully activated, and response-focused strategies (response modulation), which start operating after an emotion is under way and response tendencies have been fully activated.

Notice that this model conceptualizes phenomena in terms of simple, linear, and causal processes with the emotion unfolding from antecedents to consequents. Although the limitations of the process model (Gross, 1998b; see also Oschner & Gross, 2004) explicitly state that all regulation strategies iterate continuously, the explanation given in all studies relates to only one iteration. Prior research, in which regulation strategies were initiated in advance, showed that reappraisal was more effective in reducing negative experience and physiological arousal (e.g., Gross, 1998a; Gross & Levenson, 1997), with no memory decrements for the ETE information (Richards & Gross, 2000) relative to expressive suppression of facial expression. These findings, favoring reappraisal's effectiveness, were explained by the fact that reappraisal is categorized as an antecedent-focused strategy whereas suppression is a response-focused strategy (Gross, 2001; Richards & Gross, 2000).

We agree that when reappraisal is initiated in advance it operates as antecedent focused—changing the meaning of the situation before response tendencies are fully activated. However, this dichotomous categorization between antecedent- and response-focused strategies does not apply to online regulation. In this case, all strategies formerly characterized as antecedent focused could operate at any point along the emotion generative process. For example, in a heated argument, one could start distracting oneself, or reappraising the situation, at any point during the quarrel, even when already very upset. Therefore, the question regarding the relative effectiveness of emotion regulation strategies for online regulation remains unanswered.

Individual Difference Studies

Suggestive and indirect support for the success of online regulation comes from studies using distraction instructions with dysphoric individuals (Lyubomirsky & Nolen-Hoeksema, 1993; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema, 1991; Nolen-Hoeksema & Morrow, 1993). These results clearly showed the effectiveness of distraction in reducing dysphoria-related feelings. However, these results may have limited relevance for our question because dysphoria is putatively different from the manipulated situational mood we discuss (see Joormann & Siemer, 2004).

Other individual difference studies did just the reverse: They measured emotion regulation habits and induced the emotion experimentally. Such studies showed that repressors (individuals who try to prevent negative experience by avoiding the exposure to negative material; Olson & Zanna, 1979) experienced lower levels of negative affect in response to an ETE relative to nonrepressors (Weinberger, Schwartz, & Davidson, 1979), with a cognitive price observed in poor memory for emotional events (Hansen & Hansen, 1988). These results could not determine whether the improved emotion was entirely due to emotion regulation because emotion regulation was not manipulated.

Regulation After the ETE Terminated and Online Regulation

Several experimental studies showed that regulation strategies were effective when initiated after negative emotions had sufficiently evolved. Rusting and DeHart (2000) showed that participants instructed to employ positive reappraisal (concentrating on positive aspects) after a negative mood induction retrieved more positive memories relative to control and rumination groups. Joormann and Siemer (2004) showed that distraction improved negative mood relative to rumination. However, with regard to online regulation, the results of these studies are inconclusive. One could argue that the termination of the ETE acted as a regulator by removing the cause of the negative emotion, making it easier to use emotion regulation strategies such as distraction and reappraisal.

We are aware of a few experimental studies that tested online regulation (Ochsner et al., 2002; Ochsner et al., 2004; Ray et al., 2005). In these neuro-imaging studies, participants initiated reappraisal after experiencing emotions for a brief period. The authors found that cognitive reappraisal reduced negative experience. Nonetheless, because of scanning requirements, the time permitted (4 s) for experiencing the emotion before starting to regulate did not allow the participants to implement a regulation strategy, whereas the negative emotion was substantially developed.

Online Regulation: A Dynamic System Approach

An appropriate account for online regulation is given by theories that view the emotional and regulatory

systems as dynamic—changing continuously and evolving in time (e.g., Chow, Ram, Boker, Fujita, & Clore, 2005; Larsen, 2000). For example, Hoeksma, Oosterlaan, and Schipper (2004) suggested a system conceptualization that includes three agents: the input (the ETE), the state (the emotional system), and the control (regulation). The goal of emotion regulation is to force the emotional system in a preferred direction by changing its input. The control process includes changing the input of the ETE (e.g., through distraction and reappraisal) with the purpose of stopping the emotional system. Changing the input of the system can change the state of the system only if this process is stopped in time. If it does not stop in time, the system is likely to continue its course. Specifically, when the emotion is sufficiently developed, emotion regulation might become exceptionally difficult, creating a point of no return. We draw an analogy here to similar questions addressed in the literature regarding motor response inhibition (de Jong, Coles, Logan, & Gratton, 1990). The model in this literature (Logan, 1994) describes a competition between a go process (the emotion, in this case) and a stop process (regulation), where the observed outcome depends on the relative potency of these two processes. Notice that our approach views emotion and regulation as continuous and accumulating processes. Accordingly, all regulation strategies could operate at any point during the emotion generative process. Emotion does not have to be fully activated for it to dominate the regulatory process.

Overview of the Present Research

The major contribution of this study was in (a) examining whether such online regulation is possible and (b) comparing the effectiveness of two regulation strategies—reappraisal and distraction—with respect to their putative point of no return. We concentrated on sadness because it is characterized by a wave-like pattern with slow onset, peak of intensity, and slow decay (e.g., Damasio, 1999). These characteristics made it possible to elicit the emotion regulation strategies with subtitles at different points along the emotional development trajectory. The reason for focusing on these two strategies is that previous research has established their effectiveness in reducing sadness, making them appropriate candidates for testing their effectiveness online. Strategies focusing on situation selection and modification are irrelevant for online regulation (they do not occur during the ETE), and suppression and rumination are not appropriate because they do not decrease sadness (e.g., Gross, 1998a).

In selecting the dependent measures, we addressed two concerns. First, we wished to avoid relying exclusively on subjective reports when evaluating the regulation effectiveness and hence included performance-based measures as converging evidence. To this end, we used the Emotion Congruence Effect (ECE), indicating faster lexical decision times to emotionally congruent words as compared with neutral words (Neidenthal & Setterlund, 1994; Niedenthal, Setterlund, & Jones, 1994). Yet, this index proved insufficiently sensitive and was eventually replaced by a newly developed, autobiographic memory retrieval task. Second, we did not want to rely exclusively on the face-valid difference between distraction and reappraisal. Hence, we included a performance-based measure to show that differential instructions lead to differential processing modes. Previous studies showed that distraction but not reappraisal was accompanied by decrements in ETE memory (Richards & Gross, 2000, 2006). We therefore included such a measure in our study.

Two film clips that were edited from documentary television programs and rated as primarily inducing sadness were used as the ETE. An additional film clip served as a happy mood induction in Experiment 3 to validate the autobiographical memory measure. In a pilot study, we showed that the film induced sadness and that reappraisal and distraction strategies reduced sadness when instructed in advance, as in previous studies. Experiment 1 examined the core questions regarding online emotion regulation. Experiment 2 replicated and extended the results of Experiment 1 concerning the point of no return. Experiment 3 provided converging evidence for this effect using a performance-based autobiographical memory measure.

PILOT STUDY

The primary goal of the pilot study was to set the stage for the remaining experiments by showing that the film induced sadness and that instructing via subtitles is effective. In using subtitles, we capitalized on Israelis' familiarity with reading subtitles, as foreign movies are never dubbed in Israel and subtitles appear even in Hebrew-speaking movies. Participants were assigned to one of three strategy conditions. One group was instructed to engage in neutral thoughts unrelated to the film's content (distraction), a second group was instructed to adopt a neutral attitude toward the film (cognitive reappraisal), and the third group was instructed to view the film carefully and to allow their emotions to arise (control unregulated). The instructions for control unregulated differ from the control condition in Richards and Gross's (2000) study in explicitly instructing the participants to allow themselves to experience their emotions. This was done to minimize the chances that participants would spontaneously attempt to down-regulate their sad emotions.

As dependent variables, we used subjective reports of the negative emotional experience as well as the ECE. Based on previous research, the predictions were that distraction and cognitive reappraisal would show lower negative experience than control unregulated and that the latter would also show an ECE.

Method

Participants

Thirty undergraduate students (26 women; *M* age = 22.5, *SD* = 1.2) participated in the experiment for partial course credit. Because a (Hebrew) lexical decision task was used, all participants were native Hebrew speakers. Participants were assigned to groups according to the order in which they entered the experiment.

Film Stimulus

A 4:10-min film clip was shown. The film clip was taken from the TV documentary *The Real Story* about Holocaust survivors hospitalized in a mental institution after being abandoned by their families and society. The film consists of three edited scenes. The first scene announces the topic, accompanied by short black-and-white frames of survivors, ending with a close-up on a sad facial expression of a hospitalized survivor. In the second scene a survivor depicts, in a highly emotional manner, the sad story of the hospitalized survivors abandoned by society. The last scene shows the funeral of one of the survivors. Another survivor bursts into tears during the eulogy, claiming that only death liberated the deceased from suffering. The film was rated by five clinical psychology graduate students on both discreteness and intensity of the elicited emotion. Four raters stated that the film elicits sadness (*M* rating = 5.7, *SD* = .5 on 1–7 scale) exclusively, and one rater stated that the film elicits mostly sadness but to some extent also fear.

Presentation of Subtitles

All forms of subtitles appeared in two lines containing 13 to 15 words in Arial Hebrew regular font, 36 dots per inch. The upper and lower lines were located at approximately 14.5% and 7% from the screen bottom, respectively. Separate male and female versions of subtitles were used because of the gender inflection in Hebrew. Subtitles appeared 10 s before the film and remained visible throughout the film. Every 45 s the subtitles flashed in attempt to prevent habituation effects.

Measures

Negative emotional experience. Participants used 9-point visual analog Likert scales (1 = *not at all,* 9 = *a great deal*) to rate their current levels of sadness and general mood immediately following the mood induction phase (cf. Gilboa-Shechtman, Revelle, & Gotlib, 2000).

Emotion congruence test. The lexical decision task adheres closely to that used by Niedenthal, Setterlund, and Jones (1994). There were 10 practice trials (7 neutral words and 3 nonwords). The test included a mixed block of 43 experimental trials, 9 nonwords and 34 words, pseudo-randomly ordered. All nonwords were pronounceable letter strings that differed from stimulus words by one or two letters. The stimulus words consisted of 17 sad words (e.g., Hebrew equivalents of cry and despair) and 17 neutral words (e.g., form, stamp) that were closely matched to the sad words according to length, first letter, and grammatical category, and were evaluated as being roughly equally concrete and frequent.

The onset of each trial was signaled by a 500-ms presentation of a fixation point. Following a 200-ms blank screen, the letter string appeared for a maximum of 3,000 ms. A key press terminated the trial. Response key assignment of word and nonword were counterbalanced across participants.

Procedure

The experiment was administered individually. Experimental stimuli were presented on a 17-in. monitor. After signing a consent form and before seeing the film, participants were verbally instructed according to their experimental condition. The instructions for distraction resemble those used by Nolen-Hoeksema and Morrow (1993), and those for reappraisal adhere closely to those used by Richards and Gross (2000). The beginning of the instructions given were: "You are about to watch a short scene taken from a film. Please view the film carefully" and their end: "For your convenience we added subtitles that will appear at the bottom of the screen before and throughout the film. The purpose of the subtitles is to remind you of what you are supposed to do. Make an effort to follow these instructions at all times." The middle instruction section differed between groups as follows:

> Distraction: "In addition, we would like to see to what extent you are able to think of other things while watching the film. Therefore it is very important that you try your best to think about something that is emotionally neutral during the film. In order to do so, we ask that you simply think about something else that is not related to the film content and that is emotionally neutral. For example, you can think about a flock of birds migrating in autumn. That is to say, that at the same time of viewing the film, try to focus your thoughts on something that is external and neutral." Subtitles that

were presented in the film for the distraction condition read: "Try your best to think about something that is emotionally neutral, for example: a flock of birds migrating in autumn."
Control unregulated: "In addition, we ask that if any emotions arise while viewing, please try your best to experience them and not to block yourself from feeling. In other words, suppose the film arouses anger, joy, sadness, fear or any other emotion, simply try to experience that emotion naturally without blocking yourself from feeling." Subtitles that were presented in the film for the control unregulated condition read: "Try your best to keep viewing what is presented to you, in the same manner as you did so far."
Reappraisal: "In addition, we would like to see to what extent you can control the way you view things. Therefore, it is very important to us that you try your best to adopt a neutral attitude toward the film. To do so, we would like for you that you view the film as if you were a scientist who examines the film objectively. In other words, try to think about the film objectively and analytically rather than personally, or in any way emotionally relevant to you. So watch the film carefully, but please try to think about what you are seeing in such a way that you do not feel anything at all." Subtitles that were presented in the film for the reappraisal condition read: "Try your best to adopt an emotionless attitude, as if you were a scientist who examines the film objectively."

After viewing the film, each participant answered two questions to assess the self-reported emotional experience (sadness and general mood) and was administered the ECE. Finally, participants were given a short humorous story in an effort to improve their mood upon leaving. A detailed debriefing checked whether participants understood and employed the instructed strategies correctly.

Results and Discussion

Preliminary Data Preparation

Before performing the analyses, we reversed the general mood scores so that a higher score indicates more negative mood. Then we computed a scale for the negative emotional experience by averaging the two scales of negative mood and sadness, henceforth called *negative experience*.

Negative Experience

The mean negative experience was 5.2 for distraction, 6.5 for control unregulated, and 4.4 for cognitive reappraisal. As predicted, distraction and reappraisal participants had lower levels of negative experience relative to control unregulated participants. A planned contrast performed on the one-way analysis of variance (ANOVA) confirmed this prediction, $F(1, 27) = 14.75$, $p < .001$. Note that the two strategies did not differ from one another in effectiveness, $F(1, 27) = 2.45$, $p = .13$.

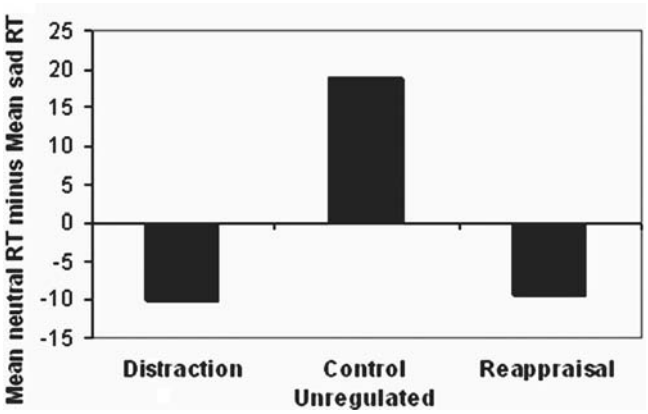

Figure 1 Mean harmonic mean neutral reaction time (RT) minus mean harmonic mean sad RT according to regulation strategy (pilot study).

ECE

In a further effort to improve statistical power (e.g., Ratcliff, 1993), we computed for each participant the harmonic mean reaction time (RT) for sadness-related and neutral words. The Strategy × Word Type interaction was marginally significant, $F(2, 27) = 3.29$, $p = .052$. Based on our prediction, a planned simple-effect contrast on the ECE within the control unregulated condition showed that for this group sad words were recognized faster than neutral words, $F(1, 27) = 4.29$, $p < .05$. As can be seen in Figure 1, this was the only group showing an ECE, with the two other groups showing a slight reversed trend that was nonsignificant.

These findings show that reappraisal and distraction led to lower levels of negative experience relative to a control unregulated condition, and they eliminated the ECE. Given the converging results of the subjective mood report and the ECE, it is unlikely that the former resulted from demand characteristics.

EXPERIMENT 1

Experiment 1 had three main goals: (a) examine online regulation, (b) search for a point of no return, and (c) show that reappraisal and distraction involve different processing mechanisms. Online regulation was made possible by manipulating the strategy initiation point along the ETE. Three initiation points were used to test the point of no return: in advance, early, and late initiations. As opposed to the pilot study, only subtitles

were used for instructions to control for the onset of emotion regulation. To determine whether the two strategies involve different processing mechanisms, we included a surprise forced-choice test of the ETE recognition memory.

It was also important to determine whether the film elicits mainly sadness among the participants. Therefore, filler questions concerning additional emotions were added to the negative emotional experience measure.

We reasoned that if there is a point of no return after which emotion regulation is ineffective, self-rated negative experience would increase among participants who were instructed to regulate emotion late in the film. We were not sure that the time passing from the beginning of the ETE until the early initiation condition would be long enough for negative experience to accumulate, as it occurred only 37 s from the film's onset. However, we expected that if there is a point of no return, negative experience would be higher when the strategy was initiated late than when it was initiated in advance and early. As for memory scores, because distraction was shown to involve an impoverished memory (Richards & Gross, 2006), we predicted that once this strategy is installed, memory for facts presented from this point onward will be poorer as compared with control unregulated. In contrast, because reappraisal has not been associated with decreased memory (Richards & Gross, 2000), we did not expect any difference in memory performance between reappraisal and control unregulated.

Method

Participants

Ninety participants (72 women; *M* age = 23.7, *SD* = 2.2) had attributes similar to those in the pilot study and were assigned to groups according to the same method.

The postexperimental debriefing showed that 11 of the 90 participants did not follow the emotion regulation instructions and were therefore replaced. The replaced participants included 1 distraction participant who reported being unable to apply the strategy, 3 control unregulated participants who reported not watching the film attentively, and 7 reappraisal participants—6 whose report indicated they misunderstood the instructions (e.g., implementing reappraisal by sitting more comfortably on the chair) and 1 who reported being unable to concentrate.

Measures

Emotion experience. In addition to rating sadness and general mood as before, the participants rated their current levels of anger, anxiety, disgust, fear, frustration, happiness, and surprise on a 9-point visual analog Likert scale (1 = *not at all,* 9 = *a great deal*).

Memory test. This measure was based on Richards and Gross (2000), yet it was built in tally with the strategy initiation times. Specifically, the strategy was initiated in advance, early, or late, thus segmenting the ETE into three sections. Participants answered 24 five-alternative, forced-choice verbal memory questions that covered the film's entire duration. Because the three scenes were not equal in length, the number of items used to assess memory for each scene was slightly different (7, 6, and 10 items for the first, second, and third scenes, respectively). One item was excluded from analyses because it was general. Therefore, the measure we used was the proportion of correct items for each scene. Memory confidence scores were also obtained for each of the memory items and were given on a 4-point Likert scale (1 = *a complete guess,* 4 = *absolutely sure*).

Procedure

The basic procedure was similar to that used in the pilot study except for the following changes. Before the film, all groups were instructed to watch carefully and try their best to experience the emotions aroused by the film without blocking them until the subtitles appeared. Participants were instructed to follow closely the instructions in the subtitles. These subtitles differed between groups and appeared either in advance (10 s before the film started), early (at the beginning of the second scene, 37.5 s from the film's onset), or late (at the beginning of the third scene, 114.0 s from the film's onset). After the film ended, participants rated their current levels of emotional experience, took the surprise memory test, and were given the humorous story and debriefing.[1]

Results

Preliminary Data Preparation

As in the pilot study, we computed a compound negative emotional experience measure.[2] Because the memory confidence ratings did not yield meaningful results, this variable is not discussed any further.

Negative Experience

A core two-way ANOVA was performed on negative experience according to two between-subjects factors: regulation strategy (distraction, control unregulated, reappraisal) and strategy initiation (in advance, early, late). The only significant effect was the main effect for regulation strategy, $F(2, 81) = 7.90$, $p < .001$, all other Fs < 2.78, *ns*. As in the pilot study, distraction ($M = 5.98$) and cognitive reappraisal ($M = 5.43$) resulted in lower self-reported negative experience as compared with control unregulated ($M = 6.83$), $F(1, 81) = 13.41$, $p < .001$.

According to the point of no return prediction, we wanted to check whether the later the initiation starts, the higher the negative experience would be for each strategy separately. The simple strategy initiation effect for reappraisal was marginal, $F(2, 81) = 2.35$, $p = .10$. Negative experience was similar when reappraisal was initiated early (second scene; $M = 5.0$) or in advance ($M = 5.1$), $F(1, 81) < 1$. Because only 37 s differentiated between the early and in advance conditions, it may be that negative experience had not yet sufficiently developed in this short time window. However, late reappraisal ($M = 6.2$) initiation resulted in marginally significant higher levels of negative experience relative to early initiation, $F(1, 81) = 3.81$, $p = .054$. This result was further supported in a significant contrast in which we compared late initiation with the pooled in advance and early initiations, $F(1, 81) = 4.67$, $p < .04$. In a series of similar contrasts, we did not find any evidence for a point of no return for distraction (all Fs < 1).

Memory Test

We computed a mixed-model three-way ANOVA on the mean proportions of correctly remembered details according to the different scenes in the film, with scene (first, second, third) as a within-subjects factor and regulation strategy and strategy initiation as between-subjects factors. We used the mean proportion as a measure to correct partly for the unequal number of items used to measure memory for each of the three scenes of the film.

We found a significant main effect of scene, $F(2, 162) = 6.53$, $p < .01$; a two-way interaction of Scene × Regulation Strategy Initiation, $F(4, 162) = 3.08$, $p < .02$; and a two-way interaction of Scene × Regulation Strategy, $F(4, 162) = 2.77$, $p < .03$. These results, however, were qualified by a three-way interaction, $F(8, 162) = 2.64$, $p < .01$.

To understand this three-way interaction, we conducted 2 three-way ANOVAs, comparing the distraction and control conditions and the reappraisal and control conditions, respectively. When we compared distraction with control unregulated, we found a significant triple interaction, $F(4, 160) = 2.65$, $p < .04$ (see Figure 2). Decomposition of this interaction was according to our prediction that distraction would be accompanied by lower memory scores once initiated onward.[3]

Probing of this triple interaction shows that when distraction was initiated before the film, memory scores for all three scenes of the film were lower relative to control unregulated, $F(1, 81) = 4.98$, $p < .03$. When distraction was initiated in the second scene, memory scores were lower from this point on (second and third scenes) relative to control unregulated $F(1, 81) = 6.28$, $p < .02$. When distraction was initiated in the third scene, we found the same predicted trend that shows a decrement in memory scores for the third scene relative to the control unregulated group. But this trend was nonsignificant, $F(1, 81) = 1.66$, $p = .20$.

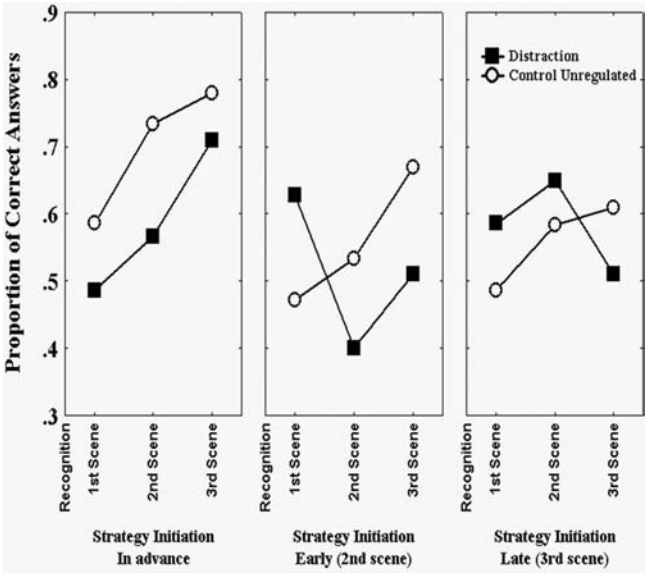

Figure 2 Proportion of correct memory answers according to strategy initiation, scene, and regulation strategy (Experiment 1).

The parallel triple interaction was not significant when we compared cognitive reappraisal with control unregulated, $F(4, 160) < 1$. Further analyses regarding reappraisal and control unregulated did not reveal any significant differences between these strategy groups, except that when reappraisal was initiated in advance (before the first scene) it was accompanied by lower memory scores of the third scene relative to control unregulated, $F(1, 81) = 7.32$, $p < .001$, an unexpected result. These comparisons show that, by and large, distraction but not reappraisal affected memory performance once it was initiated.

Discussion

Experiment 1 provided two main novel findings. First, the memory test results indicate that distraction was accompanied by poorer memory once it was initiated, thus extending Richards and Gross's (2006) results. The reduced memory scores in distraction could not be explained by the fact that participants ignored the film contents altogether, as their performance (typically .50 and above) was considerably above chance (.20). These results provide a performance-based validation that the differential instructions led to differential processing in the expected direction. Furthermore, these results show that regulation started only when it

was instructed. Contrary to expectations, we found that when reappraisal was initiated in advance it was accompanied by poor memory for the last scene. It could be that maintaining the mind-set of reappraisal becomes difficult after a while, resulting in a tendency to shift to some form of distraction. This last result should be further explored in future research.

Second, there was a hint that reappraisal but not distraction is characterized by a point of no return. Late reappraisal initiators reported marginally higher levels of negative experience relative to early initiation participants. Because this last result was tentative, we decided to replicate and strengthen it in the subsequent experiments.

EXPERIMENT 2

The goals of Experiment 2 were to extend and clarify the results concerning the point of no return. Specifically, setting different strategy initiation points for the reappraisal groups in Experiment 1 caused them to differ in two aspects: (a) unregulated duration—the time passing from the ETE onset until the strategy initiation, during which participants were allowing their feelings, and (b) regulation duration—the time passing from the strategy initiation point until the ETE termination, during which participants were employing the strategy (for a visual clarification see Figure 3a). Specifically, in Experiment 1, early reappraisal initiators had short unregulated duration and long regulation duration, while late reappraisal initiators had long unregulated duration and short regulation duration. Consequently, three hypotheses regarding the origin of this result could be made. According to one hypothesis, the difference between the reappraisal groups stems from the unregulated duration. Perhaps for late reappraisers, negative emotion has substantially evolved prior to strategy initiation, making its application difficult and hence less effective. Alternatively, the regulation duration may be critical because late initiators were applying regulation for less time than early initiators. Perhaps if provided with sufficient time, late reappraisal would also be effective. An optional third explanation that we addressed was that both the unregulated duration and the regulation duration influence negative experience. In order to isolate the influence of these factors, Experiment 2 included all four combinations of these two durations for reappraisal (Figure 3b) which resulted in three film lengths (see the following).

Experiment 1 did not reveal a point of no return for distraction suggesting that, as opposed to reappraisal, distraction is effective as soon as it is applied. However, this could be due to the fact that the late initiation point was not sufficiently late. For this reason, the late initiation condition in Experiment 2 was set at an extreme

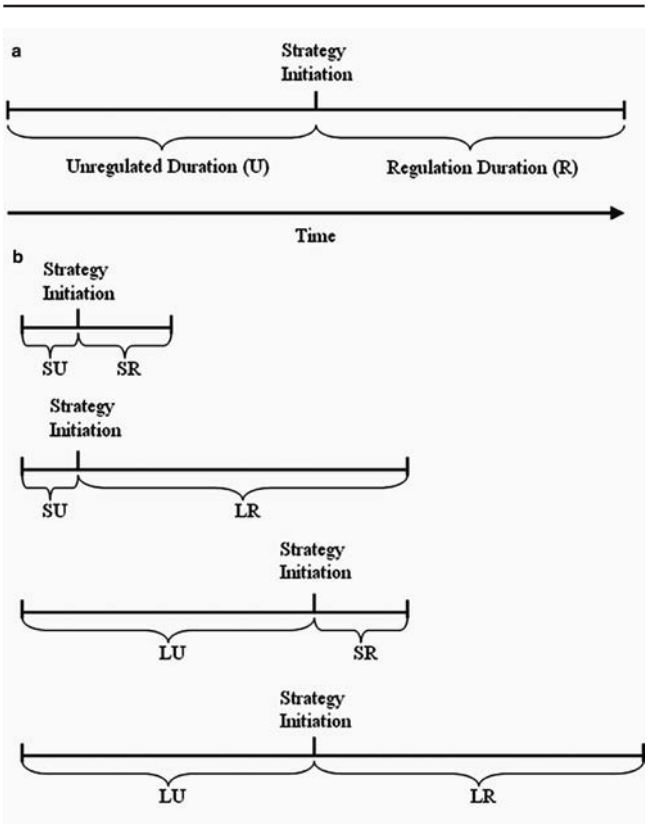

Figure 3 Illustration of the unregulated and regulation duration conditions used in Experiment 2.

NOTE: Figure 3a shows that the strategy initiation point functions as an anchor, constituting the end point of the unregulated duration variable and the starting point of the regulation duration variable. Figure 3b shows the four possible combinations for the unregulated duration and regulation duration variables: short unregulated duration–short regulation duration (SU–SR), short unregulated duration–long regulation duration (SU–LR), long unregulated duration–short regulation duration (LU–SR), and long unregulated duration–long regulation duration (LU–LR).

point relative to Experiment 1. Two distraction groups resembling those in Experiment 1 were used: early distraction (short unregulated duration–long regulation duration [SU–LR]) and late distraction (long unregulated duration–short regulation duration [LU–SR]). Note that our goal was to better establish our result concerning a point of no return, which is a novel finding. Given the little we know of this phenomenon, our goal was not to determine the precise temporal locus of this point but only to establish its existence.

The experiment also included two control unregulated groups: control long unregulated duration–short regulation duration (LU–SR) and control long unregulated duration–long regulation duration (LU–LR), which enabled us to assess the effectiveness of distraction and reappraisal. Notice that for these groups the regulation duration is meaningless, as it refers to the

point when participants received subtitles to keep watching the film in the same manner. Including these control groups also enabled us to show that the length of the film was not a factor. Importantly, we wanted to demonstrate that the results generalize to other film contents. To that end, we added a second film that deals with a family's grief for one of its members killed in military action.

Last, for this experiment we changed the instruction procedures because of the relatively high rate of participants who did not understand the regulation instructions in Experiment 1. The instruction method was a combination of the methods used in the pilot study and in Experiment 1. That is, participants received verbal instructions about one of the strategies and the control unregulated condition before the film; therefore, they did not know which set of instructions would eventually be used and when. The actual condition that a participant was intended to follow was determined by the subtitles.

The predictions were based on our conclusion from Experiment 1 that there is a point of no return for reappraisal but not for distraction. Specifically, we predicted that when reappraisal is initiated early (SU) it will be effective and when initiated late (LU) it will be ineffective. A further validation for the superior effectiveness of early over late initiation arises when comparing these conditions with the control unregulated groups matched in film lengths. Specifically, we predicted that only early reappraisal would result in lower levels of negative experience relative to the control groups. As for distraction, we predicted that the two groups would not differ from each other but would both show lower levels of negative experience relative to control unregulated participants.

Method

Participants

Eighty participants (66 women; *M* age = 23.0, *SD* = 1.4) were assigned to the eight groups as before; each received partial course credit or monetary compensation (20 NIS; approximately US$4). The debriefing indicated that only 4 of the 80 participants misunderstood the instructions, and these were replaced by 4 new participants, showing that the procedural change was effective.

Strategy Initiation Time

The strategy initiation point used in Experiment 1 served as an anchor, constituting the end point of the unregulated duration and the starting point of the regulation duration. Subtitles were identical to those used in Experiment 1.

Unregulated Duration

The unregulated duration variable had two levels that were measured from the beginning of the film until the strategy initiation point. The SU was 37.5 s, identical to the early initiation point used in Experiment 1. The LU was 190.0 s.

Regulation Duration

This regulation duration variable had two levels that were measured from the strategy initiation point until the film's termination. The SR was 60.0 s and the LR was 212.5 s.

Film Duration and Stimuli

Incorporating the two preceding variables resulted in three film lengths. An SU combined with SR (SU–SR) resulted in a 97.5-s film. The combinations of SU–LR and LU–SR constituted a 250.0-s film, which was similar to the film duration in the pilot study and in Experiment 1. The LU–LR combination constituted a 402.0-s film.

For this experiment we used two films. Half of the participants viewed the Holocaust film used in the pilot study and in Experiment 1. For the LU–LR condition we added another section at the end of the film (taken from the same documentary film). In this section, a woman describes her sorrowful feelings toward her hospitalized mother. The rest of the participants viewed a film that deals with bereavement. It portrays a grieving family trying to cope with the death of one of its members in military action. The story starts with a television broadcast announcing that a soldier was killed in military action. In the second scene, the mother shows her son's room. In the third scene, the family members and the soldier's girlfriend share their memories of him, followed by saddening recollections told by the soldier's platoon members. We made three film lengths for this film too, with identical strategy initiation points, and film durations largely the same (the largest discrepancy being 2.0 s) as those of the Holocaust film.

Procedure

To prevent them from using a strategy from the film's onset, participants were given two types of verbal instructions: instructions for one of the strategies (distraction or reappraisal) and instructions for the control unregulated condition. The participants were also asked how they planned to implement the strategy if asked; this was done to ensure their comprehension of the instructions and the immediate initiation. Participants were told that, in fact, only one type of subtitles would appear and would remain valid thereafter. As in Experiment 1, participants were told to allow their feelings

to arise before receiving the subtitle instructions. We added the advance instruction phase because Experiment 1 showed that 15% of the participants had to be replaced, most of whom did not understand the instructions or did not implement them correctly. Immediately after watching the film, participants answered the emotion experience questions, followed by the ECE. Finally participants were given the funny story to read and were debriefed.

Results

Preliminary Analyses for Negative Experience

The dependent variable in all analyses was the mean of the negative mood and sadness, as in the pilot study and Experiment 1.[4]

To check for film type effects, we computed a two-way between-subjects ANOVA with film type (holocaust vs. bereavement) and condition (distraction SU–LR, distraction LU–SR, reappraisal SU–LR, reappraisal LU–SR, reappraisal LU–LR, reappraisal SU–SR, control unregulated LU–SR, control unregulated LU–LR) as factors. The main effect of film type and the two-way interaction were nonsignificant (Fs < 1).[5] Therefore, the remaining analyses pooled across film type.

To rule out film duration effects, we computed a planned contrast comparing the two control unregulated groups (which differed only in film duration) and found that it was nonsignificant ($F < 1$). In addition, for the reappraisal groups (which was the only strategy that showed effects concerning point of no return), if there had been a film duration effect, one would predict that the long film would result in more negative experience relative to the intermediate film. To check this, we conducted a planned contrast between reappraisal LU–SR and reappraisal SU–LR (both are of intermediate duration) on the one hand, and reappraisal LU–LR on the other. This contrast, too, was nonsignificant ($F < 1$).

The subsequent analyses aimed at decomposing the significant condition main effect, $F(7, 72) = 4.59$, $p < .0005$. To this end, for each strategy we compared the negative experience results for early versus late initiation as well as comparing these groups with the control unregulated groups who corresponded to them in film length (see Figure 4).

Comparisons Within Each Strategy

To check whether distraction was associated with a point of no return, we computed a planned contrast that compared the early and late distraction groups (SU–LR and LU–SR, respectively). This contrast was nonsignificant, $F(1, 18) < 1$. Thus, even when distraction was initiated late and the regulation duration was short, it was as effective in reducing the negative affect as when it was initiated early. To check our prediction concerning a point of no return for reappraisal, we performed a two-way ANOVA on the results of the reappraisal groups with unregulated duration (short, long) and regulation duration (short, long) as between-subjects factors. The only significant effect was a main effect for unregulated duration, $F(1, 36) = 8.28$, $p < .01$, indicating that when early reappraisal took place (SU), the negative experience was lower relative to late reappraisal (LU) regardless of the regulation duration.

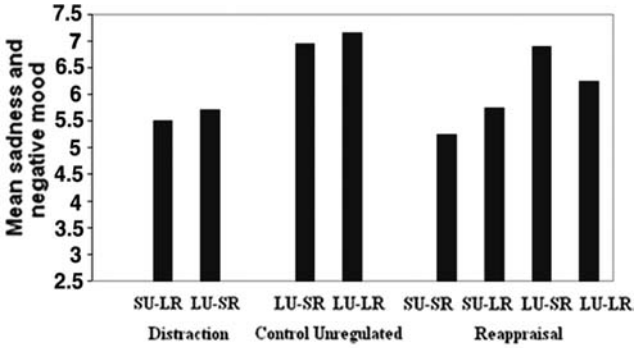

Figure 4 Mean of negative experience according to regulation strategy, unregulated duration, and regulation duration (Experiment 2).

NOTE: SU–SR = short unregulated duration–short regulation duration; SU–LR = short unregulated duration–long regulation duration; LU–SR = long unregulated duration–short regulation duration; LU–LR = long unregulated duration–long regulation duration.

Further Validation: Comparison of Strategies

When initiated early, both strategies are equally effective. To check the hypothesis that both early reappraisal (SU–LR) and early distraction (SU–LR) would be effective relative to a corresponding control unregulated condition (LU–SR), we decomposed a significant one-way ANOVA, $F(2, 27) = 4.29$, $p < .03$. A planned contrast indicated that both reappraisal and distraction showed lower levels of negative experience relative to the control group, $F(1, 27) = 8.35$, $p < .01$.[6] Notice that reappraisal and distraction did not differ from one another, $F(1, 27) < 1$.

When initiated late but applied for a short period, distraction is more effective than reappraisal. A one-way ANOVA was imposed to check whether late distraction (LU–SR) would be more effective than late reappraisal (LU–SR) relative to a corresponding control unregulated group (LU–SR). A decomposition of the significant main effect, $F(2, 27) = 4.48$, $p < .03$,

indicated that late distraction showed lower levels of negative experience relative to the control group, $F(1, 27) = 6.98$, $p < .02$. However, late reappraisal resulted in levels of negative experience similar to a control group, $F(1, 27) < 1$.

When initiated late, lengthy reappraisal shows signs of recovery. The late reappraisal (LU–LR) showed a marginal trend of lower levels of negative experience relative to the control unregulated (LU–LR) group, $F(1, 18) = 4.25$, $p = .054$.

Discussion

This experiment revealed and clarified an important differentiation in effectiveness between reappraisal and distraction. The use of a very late initiation point made it unlikely that distraction is characterized by a point of no return and suggests that this strategy is effective as soon as it is applied. By contrast, overall reappraisal was more effective when initiated early relative to late. The LU–LR reappraisal group showed a marginally significant trend for recovery. This trend suggests that recovery from sad mood by reappraisal may be possible with a long regulation period, even when regulation starts late. These effects generalized beyond specific film content.

EXPERIMENT 3

Experiments 1 and 2 showed differences in subjective negative experience between late and early reappraisal initiators. One could argue that these differences derive from possible self-report biases. Specifically, late reappraisal initiators do not feel worse than early initiators; they simply think that because they received the strategy late they are expected to feel worse, and this knowledge governs their self-report. Similarly, perhaps late reappraisers feel more comfortable to admit their negative feelings relative to early reappraisers. To address these shortcomings, we conducted an additional experiment in which we led participants to believe that reappraisal is in fact more effective when implemented late. In addition, we added another performance-based measure of sadness, fluency of autobiographical memory (FAM), in which we assessed the relative speed and fluency of happy memory retrieval. The logic employed was to integrate two well-established effects in a single measure, thus ensuring large effects and high sensitivity. Specifically, ineffective regulation, which results in sad mood, is expected to result in both (a) a relatively slow recall of a first happy autobiographical experience (e.g., Boden & Baumeister, 1997) and (b) a reduced fluency observed in a difficulty to obtain multiple happy memories. Bartolic, Basso, Schefft, Glauser, and Titanic-Schefft (1999) found that induced dysphoria resulted in reduced verbal fluency. In addition, reduced fluency could be predicted based on the associative network model (Hansen & Hansen, 1988): Even if one manages to attend away from upsetting information (e.g., by recalling one happy memory), the sad mind may drift readily to another unpleasant thought, making it harder to recall additional happy memories. To validate this new and improved measure, we added a third group that underwent a happy mood induction.

Under the hypothesis that self-report biases are the *only* factor driving the group differences obtained for early versus late reappraisal, the self-report effects from Experiments 1 and 2 should reverse. Specifically, because participants were led to believe that late reappraisal is more effective than early reappraisal, early reappraisers would feel more comfortable to admit their negative feelings or they would believe that they are expected to feel sad, and their self-report of negative experience should show this trend. In addition, because this hypothesis assumes no genuine mood differences between groups, the two reappraisal groups would not differ in their FAM scores, which reflect performance rather than self-report. Conversely, if the self-report effects from Experiments 1 and 2 reflect genuine emotion (even partially), FAM scores should be worse for late than for early reappraisal, supporting the point of no return hypothesis. FAM scores for late reappraisal would also be worse than for happy group, providing validation for the FAM measure.

Method

Participants

Twenty-one participants (18 women; M age = 23.8, SD = 1.1) were assigned to three groups as before and received the same partial course credit or monetary compensation.

Film Stimuli

Early and late reappraisal groups watched the intermediate (4:10 minute) holocaust film used in Pilot study and Experiments 1 and 2. The happy group watched a 5:19-min happy film clip. This film clip was taken from a famous Israeli stand-up comedy *The Assi and Guri Show*. It consists of two edited scenes. In the first scene the two comedians perform a pantomime of a live music band. In the second scene, one of the comedians plays an interviewer that tries to force the other to believe that he was kidnapped by aliens. When the interviewee finally complies, he uses his very "elaborate" imagination to describe his alien kidnap experience.

Strategy Initiation Time

Early and late reappraisal conditions were identical to the SU–LR and LU–SR conditions, respectively, in Experiment 2.

Measures

Negative experience. This measure is identical to that used in Experiments 2 and 3.

FAM. The verbal instructions used adhered to those used by Boden and Baumeister (1997). Participants were asked to recall as many different specific personal events that occurred to them in a specific time and place. They were told that the exact content would be given at the end of the instructions. It was explained that the execution of the task consists of three recurrent phases. First, participants had to recall an event; second, to press a button; and finally, to write on a piece of paper one key word that sums up the event. Participants were told to keep doing this task until a different instruction appeared. The new instructions asked the participants to write a description for every key word they had provided. Participants' descriptions included why this event was happy for them, and when and where the event occurred. Participants were told that if a specific event they recalled was too personal, they could just write the time and place of occurrence without the detailed clarification. Then the experimenter explained the desired content, saying: "Try to recall as many different personal *happy* memories which happened to you in a certain time and place." At the conclusion of this statement the experimenter pressed a key that set the time and left the room. The main instructions were written on the computer screen. Every time the participant pressed a button the color of the screen changed (from black to gray to silver in a cyclical manner). Participants were given 2:40 min for this task. The main dependent measures were RT for the first memory and the total number of different events.

Procedure

The instructional phase for the two reappraisal groups was almost identical to that used in Experiment 2, except for the contradicting information regarding the effectiveness of the strategies. Both groups were told that "several studies performed in our laboratory and several other studies in the literature have found that when participants received the reappraisal instructions early they reported that the initiation is confusing. They sensed that since they were not yet familiar with the film's characters it was hard to understand the story and at the same time to apply reappraisal. This sense of confusion resulted in a bad mood. On the other hand, when participants received the reappraisal instructions late, they said that it was easy and less confusing to apply. Participants sensed that since they were already familiar with the film's characters it was easy for them to initiate reappraisal, and this resulted in an effective initiation and a better mood."

The whole procedure included five serial phases: verbal instructions, mood induction, mood check, autobiographical memory task, and detailed debriefing. During the debriefing the experimenter asked how participants initiated the strategy, but most important, he checked whether participants knew when they had received the subtitle instructions (early or late) and whether they remembered and complied with the contradicting instructions. All the participants remembered the contradicting instructions, indicated that this background information made sense to them, and knew when they had received the subtitles.

Results

Negative Experience

The mean negative experience was 5.36 for early reappraisal, 5.5 for late reappraisal, and 2.36 for the happy group. This difference proved significant in a one-way ANOVA, $F(2, 18) = 14.32$, $p < .001$. As expected, the happy group reported the lowest levels of negative experience relative to the two reappraisal groups, $F(1, 18) = 28.59$, $p < .0001$. The early and late reappraisal groups, though, showed similar levels of negative experience, $F(1, 18) < 1$.

FAM[7]

Latency for the first memory. When reappraisal was initiated late, it took more than twice as long to recall the first happy memory ($M = 25.3$) relative to early initiation ($M = 10.5$), $F(1, 18) = 10.86$, $p < .01$, and happy ($M = 11.5$), $F(1, 18) = 9.37$, $p < .01$. By contrast the early reappraisal group did not differ from the happy group, $F(1, 18) < 1$(see Figure 5, Panel A).

Total amount of happy memories. Complementary to the latency measure, late reappraisal participants recalled fewer happy memories ($M = 5.71$) relative to their early reappraisal ($M = 8.86$), $F(1, 18) = 6.64$, $p < .02$, and happy ($M = 9.29$), $F(1, 18) = 8.57$, $p < .01$ counterparts. Again, the early reappraisal group did not differ significantly from the happy group, $F(2, 18) < 1$ (see Figure 5, Panel B).

Discussion

The FAM results exclusively supported the point of no return account. Late reappraisal initiation results in profound difficulties seen in the speed and amount of recalling

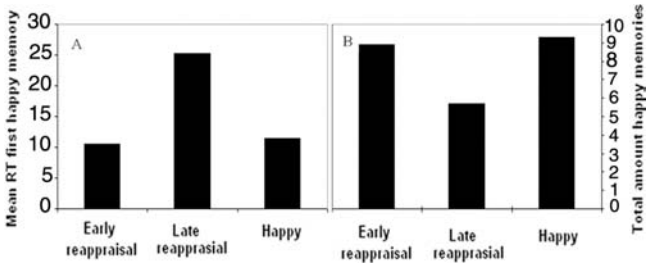

Figure 5 Mean reaction time (RT) in seconds for first happy memory (Panel A) and mean amount of happy memories (Panel B) according to group (Experiment 3).

personal happy memories. If anything, the effects we obtained in these measures are underestimated, and they go beyond the contradicting instructions participants received. Conversely, both the happy and early reappraisal groups needed a short time to recall a first happy memory and to recall a substantial amount of happy memories. To account for the lack of difference between early reappraisal and happy, we suggest that happy mood does not improve FAM performance, only that sad mood impairs it (see Yeung, Dalgleish, Golden, & Schartau, 2006, for a related finding).

The self-report results showed no differences between the two reappraisal groups. This null result suggests that the observed self-reports are influenced by both genuine feelings and by self-report biases. Whereas in Experiments1 and 2 these two factors worked in the same direction, in Experiment 3 they canceled one another. Specifically, although instruction time has driven the results in the point of no return direction, self-report biases may have driven the results in the opposite direction, eventually resulting in a null effect. Note that (a) the effects did not reverse as one would predict if only self-report biases had driven them, and (b) the contribution of self-report biases has been probably magnified relative to Experiments 1 and 2 because this knowledge was instructed explicitly in Experiment 3. To conclude, our hypothesis regarding a point of no return for reappraisal was supported by the FAM results, showing that the self-report bias hypothesis may have partially contributed to, but cannot completely account for, the results of Experiments 1 and 2.

GENERAL DISCUSSION

In the present work, we concentrated on what we argue is a common scenario in which people could start regulating their reactions at any point after the ETE started and while it is still present. We call this phenomenon *online regulation*.

In three experiments, we concentrated on the differential effectiveness of two regulation strategies—distraction and cognitive reappraisal. The most important and novel finding was that even though online regulation was possible for both strategies when initiated early, there was a point in time (or a degree of negative experience evolvement) after which distraction became the more efficient strategy—accomplishing rapid recovery despite late onset relative to reappraisal. In other words, distraction was immediately effective in reducing negative experience, even when initiated late. By contrast, when reappraisal was initiated late, it was less successful in reducing the negative experience. Late reappraisal also resulted in a reduced fluency of retrieving happy autobiographical memories. Only when provided with long regulation duration did late reappraisal show some signs of effectiveness. These results go beyond specific film content and self-report biases. In addition, online regulation by distraction was shown to be cognitively costly because it was accompanied by reduced memory for the ETE information from the point of initiation onward, indicating that distraction compromised ETE encoding. This pattern was not found for reappraisal, thus providing a performance-based validation that differential instructions led to differential processing and that regulation was initiated only when the subtitles appeared.

What could be the cause for differences in effectiveness between distraction and reappraisal? Relying on the notion that emotion is a complex multicomponent process (e.g., Fridja, 1986), we suggest that before strategy initiation, participants allow their feelings to arise coincident with establishing a train of thought in which they interpret the film using sad cognitions. It seems that online regulation of distraction and reappraisal affect this train of thought differently. Employing distraction does not require overriding the previously formed sad train of thought. It just adds a second emotionally neutral train of thought that operates in parallel and dilutes the mental representation of the ETE. It seems that these characteristics make the distraction process immediately effective. Our memory results support this account in showing that initiating distraction results in memory decrements. A similar effect is commonly found in memory research, where participants are asked to perform a secondary task while encoding the material (e.g., Craik, Govoni, Naveh-Benjamin, & Anderson, 1996). By contrast, because reappraisal involves attending to the ETE (e.g., Gross, 1998b), one has to override the previously formed sad train of thought to change it to a neutral train of thought. Therefore, the effectiveness of reappraisal seems to depend on the relative strength of the sad train of thought that precedes it. Employing reappraisal late may be especially difficult because it involves overriding

a well-established sad train of thought. By contrast, employing reappraisal early involves overriding a train of thought that barely had time to establish itself. These ideas are in line with the dynamic systems approach, which states that the effectiveness of the regulation process is heavily dependent on the level of evolvement of the emotional system (including its accompanying cognitions) it is trying to stop (e.g., Hoeksma et al., 2004).

On a more cognitive level, task switching may serve as a model for explaining the effectiveness of reappraisal because reappraisal requires switching from a sad interpretation to a neutral interpretation. This literature shows that switching between simple cognitive tasks is often associated with a performance decrement called *switching cost* (see Monsell, 2003, for review). Moreover, switching costs are especially pronounced if the stimulus to which participants respond has previously been associated with the other task (e.g., Waszak, Hommel, & Allport, 2003), especially if such an association was established for a lengthy period (Sumner & Ahmed, 2006). We argue, accordingly, that late reappraisal may involve a large switching cost because the sad train of thought (formed in response to the ETE before strategy initiation) became strongly associated with the ETE. As a result, switching to a neutral train of thought was especially difficult because the ETE kept reminding the participants of their sad thoughts.

It seems that the point of no return argument should be clarified and partially toned down. One could think that this concept means that there is a point in time where the emotion is developed to such a level that any amount of regulation would not stop it. Notice that even in the literature on motor stopping, where this concept was originally developed (de Jong et al., 1990), the findings showed that if there is such a point, it occurs very far downstream in the processing, because evidence for stopping was found even at the level of the muscles. Nevertheless, our conceptualization suggests that there is a point in time in which the emotion system substantially evolves, seriously challenging (but not completely blocking) any emotion regulation efforts. It seems that late distraction, and late reappraisal efforts of prolonged duration, proved at least partially effective in reducing negative experience.

Theorists and clinicians are frequently asked which regulation strategy works better. Our results show that the two strategies are equally effective when induced in advance and early but that distraction is more costly (in terms of ETE recollection) than reappraisal. However, when the negative emotion has developed (i.e., late initiation) and time is short, distraction proves to be more effective than reappraisal. If regulation time is unlimited, late reappraisal might also be effective. As the saying goes, "drastic times call for drastic measures"— when the negative emotion is high and time is short, the broader strategy of changing the attentional deployment works better than continuing to pay attention to the situation and changing only its meaning.

NOTES

1. The ECE measure was administered in Experiments 1 and 2 after the self-report phase. The main result (an ECE effect in the control unregulated group) was replicated in both of these studies. However, this measure failed to demonstrate temporal effects, and it is not reported any further.

2. Sadness and negative mood were rated highest (sadness: $M = 6.1$, $SD = 0.2$; negative mood: $M = 6.1$, $SD = 0.1$) and significantly higher than the next most intensive emotion, anger ($M = 5.2$, $SD = 0.3$), $F(1, 81) = 15.24$, $p < .001$, validating our compound measure of negative experience.

3. It seems that before the strategy initiation, distraction shows higher memory scores relative to control unregulated. In the middle panel of Figure 2, distraction shows heightened memory scores relative to control unregulated for the first scene, $F(1, 54) = 4.87$, $p < .04$, and in the right-most panel, distraction shows a trend of heightened memory scores for the first and second scenes, $F(1, 54) = 2.13$, $p = .15$. We suggest that the poorer memory from the strategy initiation onward, obtained for distraction (but not for control unregulated), resulted in a lesser degree of retroactive interference and consequently better memory for scenes before the strategy initiation. Before the strategy initiation, participants were instructed to watch the film carefully and they did not receive any regulation instructions. Therefore, the effects reported here cannot be attributed to differences between groups that derive from their strategy condition (which at these time points did not yet occur) and must be explained by differences present after the strategy initiation (i.e., differences between groups at the time of administration of the memory test).

4. As in Experiment 1, sadness and negative mood were rated highest ($M = 6.24$, $SD = .97$ and $M = 6.13$, $SD = 1.85$, respectively) and were significantly higher than frustration ($M = 4.53$, $SD = 2.43$), which was rated highest among the remaining emotions, $F(1, 72) = 57.14$, $p < .0001$.

5. Inspection of the trends in means indicated that all strategies showed remarkably similar results for both films.

6. Though we did not have a corresponding control group for the reappraisal SU–SR group, this group showed the lowest levels of negative experience and was not different from the effective early reappraisal SU–LR group, $F(1, 18) < 1$.

7. We also compared the two reappraisal groups in a few content variables, including mean number of words, mean number of happy words, and mean number of specific events (all Fs < 1).

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