Emotion
2015, Vol. 15, No. 1, 73–77

1528-3542/15/$12.00 http://dx.doi.org/10.1037/emo0000011

Launching Reappraisal: It's Less Common Than You Might Think

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Cognitive reappraisal is thought to be ubiquitous. However, no studies have quantified how frequently people reappraise (vs. letting their emotional response go unregulated). To address this issue, the authors created a laboratory decision context in which participants watched a series of negatively valenced images, and in each case had the option of electing to reappraise to decrease negative affect. Given the many benefits and few costs associated with reappraisal, we expected that most images would be reappraised. However, to our surprise, participants implemented reappraisals for only 16% of images (Study 1). Regulatory rates remained low for both low- and high-intensity images, even when another regulatory option (i.e., distraction) was available (Study 2). The authors hypothesized that participants did not proactively reappraise because there were hidden costs associated with reappraisal. They considered 2 classes of costs: overcoming default bias and cognitive effort, and they measured the percentage of trials for which participants chose to reappraise using a fully crossed 2 × 2 design that examined the effects of removing defaults and of providing support in creating reappraisals. Removing defaults, but not providing reappraisal support, increased rates of reappraisal (Study 3). Everyday decision-making frequently involves default options. These results suggest that contextual variables (such as the presence of defaults) may play a large role in the decision to regulate emotions.

Keywords: decision making, default preferences, emotion regulation, reappraisal

Like any other motivated behavior, emotion regulation can be thought to occur as a joint function of its costs and its benefits. It stands to reason that people should regulate their emotions if they derive a clear hedonic benefit from doing so (e.g., decreasing negative feelings) and if the costs of regulation are low. There may be situations in which people are not aware that they can regulate their emotions or in which people have instrumental motives to leave their emotions as they are (e.g., instrumental motives to maintain negative emotions; Tamir, Mitchell, & Gross, 2008), but barring these, it seems plausible that most emotional episodes are regulated whenever it is helpful to do so. But do adults actually do this?

In the present work, we sought to empirically address this important question. As a test case, we focused on one of the best-researched forms of explicit emotion regulation—cognitive reappraisal. Cognitive reappraisal is a cognitive-linguistic strategy that alters the trajectory of emotional responses by reformulating the meaning of a situation (Gross, 2014). It seemed a good test case because compared to people who use reappraisal infrequently, frequent reappraisers show self-reported affective, cognitive, and social benefits (Gross & John, 2003).

We created a laboratory decision context in which participants were asked to watch negatively valenced affective images in a series of trials. On each viewing, they had the option of electing to reappraise to decrease negative affect and thus derive hedonic benefits. The cost of choosing to reappraise was a simple button press requiring negligible effort. Our task was designed to ensure that participants had no instrumental motives to maintain negative emotion. Further, participants were given detailed pre-experiment instructions on how to reappraise. Participants thus knew both that they could reappraise and how to do so in this context.

We expected that participants would elect to reappraise for the vast majority of trials. A prestudy survey of 108 adult Mechanical Turk workers suggested that our intuition was generally shared. We asked survey-responders to predict participant behavior in the decision context outlined above. Reappraisals were predicted, on average, for over 70% of trials.

However, this shared intuition was incorrect. In Study 1, participants decided to proactively reappraise only 16.1% of all viewed images. In Study 2, we demonstrated that regulatory rates remained low for both low- (LI) and high-intensity (HI) images, even when another regulatory option (i.e., distraction) was available.

We reasoned that there were two potential factors that might have contributed to the puzzlingly low rate of reappraisal. First, participants might have found reappraisal difficult to execute. Thus the costs of reappraisal may have exceeded its benefits leading to a decision not to reappraise. Second, default factors may have played a role. Decision theorists (e.g., Samuelson & Zeckhauser, 1988) have documented that people are disproportionately likely to stick with a default option compared to equivalent decision contexts in which the same option is not designated to be the default. In Study 1 and Study 2, reappraisal difficulty was not manipulated and watching was designated to be the default option. In Study 3, we manipulated these two factors and measured impacts on regulation choice.

This article was published Online First July 7, 2014.

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Study 1: Proactive Reappraisals Occur in a Small Fraction of Emotional Events

We sought to measure the percentage of trials in which participants chose to reappraise (vs. watch) while viewing a series of negatively valenced images.

Method

Forty undergraduates (24 women) were each given detailed reappraisal instructions, six practice trials, and 40 experimental trials. In each trial, participants were first shown a brief flash (0.5 s) of a negatively valenced IAPS image. They were then shown a choice screen (for 15 s with a timer ticking off the seconds) informing them that if they did nothing, their instruction would be to "watch" the image. The bottom half of the screen reminded the participants that they could elect press "c" to change their instruction from "watch" to "reappraise."

Participants could press "c" at any time during the choice screen. The choice screen was given a long duration to ensure that there was minimal possibility of participant inaction due to a shortage of time. After 15 s of the choice screen, an instruction screen appeared for 2 s. If the participant had pressed "c" in the choice screen, their instruction screen asked them to "reappraise," else their instruction was to "watch."

Following the instruction screen, the image (that had been flashed previously) appeared for 5 s. During this time, participants were asked to implement their instruction (i.e., "watch" or "reappraise"). Prior studies have shown that in emotion regulation choice contexts, participants do follow such instructions (Sheppes, Scheibe, Suri, & Gross, 2011). The implementation time was kept limited to 5 s to reduce the possibility of participants following the instruction at the outset but then changing their minds. Participants were explicitly asked not to distract or look away during the watch trials or not to avoid attempting reappraisal during the reappraisal trials. Subsequently, participants were asked to rate their affect on a 0–10 scale.

Before the experiment started, participants were (mis)informed that the experimenters sought to measure the physiological effects of watching and reappraising, and a finger cuff was attached. This was to minimize demand characteristics (which could have provided participants with instrumental goals not to reappraise) by drawing participants' attention away from their choice as the DV of interest to the experimenters. No physiological data were actually collected.

In postexperiment debriefings, 100% of the participants in Study 1 (and also in Studies 2 and 3) stated that they believed the cover story about the purpose of the experiment. All participants also stated that they did not feel that the experimenters wanted them to choose any one option over the other. Further, all participants agreed with the statement that they had no difficulty in following instructions and complied with them fully. Finally, there were no data exclusions or additional manipulations in Study 1 (or Studies 2 and 3).

Results

On average, participants chose to reappraise during only 16.1% of trials (95% confidence interval [CI], 9.6–22.4%).

Participants felt less negative for reappraise trials than watch trials. The posttrial affect rating (higher numbers represent less negative ratings) was 4.45 for trials that were reappraised and 3.95 for trials that were not reappraised (i.e., watched). The difference was significant, reappraise vs. watch, $t(1598) = 3.87$, $p < .001$, $d = 0.23$; comparison to a mixed-effects model showed that there were no (random) subject effects. This difference in reported affect was not driven by the normative valence ratings of the stimuli that were selected for reappraisal (mean valence 3.05) versus those that were not (mean valence 3.12). In the International Affective Picture System, lower scores on valence represent higher levels of negative emotion.

Despite the clear affective benefits associated with reappraisal, the percentage of trials for which proactive reappraisals were attempted was puzzlingly low and was counter to our prestudy expectations. In Study 2 we investigated whether this effect was driven by the absence of regulatory options that were best suited to the intensity of the displayed images.

Study 2: Reappraisal Rates Are Not Affected by Image Intensity or Regulatory Options

Prior research has demonstrated that people tend to choose cognitive reappraisal as a regulation strategy for LI stimuli and attentional distraction as a regulation strategy for HI stimuli (Sheppes et al., 2011). This led us to consider the possibility that participants in Study 1 might have avoided reappraising because they preferred to use distraction as a regulatory strategy (at least for the HI images on offer). Because distraction was not an option, they might have settled for watching the images instead.

To test this possibility, we measured reappraisal rates for LI and HI images in a decision context that included distraction as a regulatory option.

Method

Following Sheppes et al. (2011), we created a set of 15 HI (mean arousal = 6.12; mean valence = 1.99) and 15 LI images (mean arousal = 5.01; mean valence = 3.41). These image sets were identical to those used in prior research.

Twenty-five undergraduates (13 women) were asked to view a shuffled set of HI and LI images. They were given training and instructions identical to those used in Study 1 with the following exceptions. In addition to being taught to reappraise, participants were trained to distract by thinking of a neutral activity. As before, they were given a default instruction of "watch" but a sign on the bottom half of the choice screen now reminded them that they could press "r" to reappraise or "d" to distract. If they elected to do neither, an instruction screen informed them that they were to watch the image; else they were asked to reappraise the image (if they had pressed "r" in the choice screen) or distract from it (if they had pressed "d" in the choice screen).

The other instructions, practice trials, the misdirection with the physiological monitor were identical to Study 1. As before no physiological data were recorded and as in Study 1, 100% of the participants stated that they believed the cover story about the purpose of the experiment and did not feel that the experimenters wanted them to choose any one option over the other.

Results

On average, participants chose to reappraise during only 12.4% of total trials (95% CI, 9.9–14.8%). The reappraisal rate for HI trials was 12% and for LI trials was 12.8%. The reappraisal rates were not moderated by intensity, $t(48) = 0.26$, $p = .79$.

Participants chose to distract during 10.6% of HI trials and 7.4% of LI trials (9.0% overall, 95% CI, 6.7–11.43%). These rates were not moderated by intensity, $t(48) = 1.07$, $p = .29$. Participants watched 77.3% of HI trials and 79.7% of LI trials (78.5% overall, 95% CI, 74.7–82.3%). These rates were also not moderated by intensity, $t(48) = 0.55$, $p = .58$.

These results do not contradict earlier studies that found that regulation choice was driven by intensity (Sheppes et al., 2011). In the current decision context, the vast majority of trials were watched, not regulated; it was thus not possible to test whether the type of regulation chosen (in the subset of trials that were regulated) was moderated by intensity.

Study 2 findings suggest that it is unlikely that the low rates of reappraisal in Study 1 can be explained by the high negative valence of the pictures. Further, compared to Study 1, reappraisal rates did not increase (for either HI or LI images) with the presence of attentional distraction as an alternative regulatory option. These results also demonstrate that low rates of regulation are not applicable to reappraisal only. When both reappraisal and distraction were available, participants chose to stay with the default "watch" option in 78.5% of all trials.

As in Study 1, reappraisal increased posttrial affect ratings. The posttrial affect rating (higher numbers represent less negative ratings) was 4.42 for trials that were reappraised and 3.87 for trials that were watched—reappraise versus watch, $t(748) = 2.89$, $p = .002$, $d = 0.21$. This difference in reported affect was not driven by the normative valence ratings of the stimuli that were selected for reappraisal (mean valence 2.68) versus those that were watched (mean valence 2.77). As in Study 1, lower valence scores represent higher levels of negative emotion.

In Study 3, we continued to focus on reappraisal as a test case for investigating regulation frequency and sought to identify the drivers of the low rates of reappraisal.

Study 3: Removing Defaults Increases Reappraisal

The benefits of reappraisal are numerous and profound (Gross, 2014). Despite these benefits, and despite higher affect ratings for reappraisal trials, reappraisal was attempted at low rates in Study 1 and Study 2. This suggests that there might be costs associated with reappraisal. We investigated two types of costs that we thought might contribute to these low rates: (a) costs of overcoming default preferences and (b) cognitive costs related to generating new reappraisals.

The first type of cost of reappraisal use is overcoming the bias shown by decision makers that leads them to prefer a default option (Dinner, Johnson, Goldstein, & Liu, 2011). A default option is defined as the option that is chosen if the decision-maker does not act. Default preferences are seen as a bias because merely designating an option as the default increases the frequency of its selection even though its attractiveness remains unchanged. Such preferences have been observed in many decision domains including organ donation (Johnson & Goldstein, 2003) and retirement plans (Beshears et al., 2006). We reasoned that if participants in Study 1 and Study 2 had failed to choose reappraisal because they were biased toward the default (i.e., watching), then removing the default option would increase the percentage of trials on which they would choose to reappraise.

The second type of cost of reappraisal use is the cognitive effort associated with reappraisal. We reasoned that if participants in Study 1 and Study 2 had failed to choose reappraisal because of the effort associated with formulating an effective reappraisal, then providing them such reappraisals would increase the percentage of trials on which they would choose to reappraise.

To examine the simple and interactive effects of these two types of costs, we created (a) a proactive condition that contained a default instruction, and a marked choice condition in which participants had an explicit choice between watching or reappraising, but there was no default instruction; and (b) we created a support condition, in which participants were provided with a plausible reappraisal for each image in the experiment, and a no-support condition in which participants had to create their own reappraisals (if they chose to reappraise). We used a fully crossed 2×2 design. We expected to replicate the findings of Study 1 and Study 2 for the group in which defaults were present and no support was provided. We expected other groups to show higher rates of reappraisal use.

Method

Eighty-eight undergraduates were randomly assigned to the following four equal groups of 22 (11 women in each): (a) default choice, no support; (b) default choice with support; (c) no default, no support; and (d) no default with support. Each group completed 40 trials.

The default choice, no support group (Group 1) received instructions identical to those described in Study 1, with one exception—the default instruction was "watch" for 50% of the trials and "reappraise" for 50% of the trials. This allowed us to test whether participants had a preference for the default, or whether they simply had a preference for watching images. If participants did nothing, they were asked to stay with the default instruction. If they pressed "c," their instruction was changed (from Watch to Reappraise or from Reappraise to Watch).

The default choice with support group (Group 2) was similar to Group 1 with one exception: Both instructions (watch and reappraise) were accompanied with two distinct short comments that, in the watch condition, described the image neutrally (e.g., "This image displays a wound.") and, in the reappraise condition, reinterpreted the meaning of the image in a less negative way (e.g., "This is an incision made by surgeon."). These comments were shown just below the respective strategies on the slide on the choice screen described in Study 2.

The no default, no support group (Group 3) did not contain a default instruction and did not suggest reappraisal. In the choice screen the two choices (watch and reappraise) were presented side by side (counterbalanced) and separated by a vertical line. Subjects needed to press separate buttons in order to choose between the two alternatives.

The no default with support group (Group 4) was similar to Group 3 (two choices presented side by side on choice screen). However, as in Group 2, two distinct short comments either

describing the image or suggesting an alternative appraisal accompanied the watch and reappraise instructions.

The instructions, practice trials, and the misdirection with the physiological monitor were identical to Study 1 and 2 for all four groups. As before no data were recorded and 100% of the participants stated that they believed the cover story about the purpose of the experiment and did not feel that the experimenters wanted them to choose any one option over the other.

Results and Discussion

Reappraisal rates were compared using a 2 (default condition: "watch" default vs. no default) × 2 (support condition: reappraisal support vs. no support) analysis of variance. This analysis revealed no interaction effect, $F(1, 84) = 0.005$, $p = .93$. However, the main effect of default was significant, $F(1, 84) = 49.28$, $p < .001$. Follow-up *t*-tests indicated that that removing the requirement to proactively override the default instruction, and instead providing the "watch" and "reappraise" choices without a default, increased the number of trials for which the reappraise option was chosen. There was no main effect of support, $F(1, 84) = 3.36$, $p = .07$. Providing reappraisal support did not significantly increase reappraisal choice (there was however a trend that suggested that providing reappraisal support may marginally increase the percentage trials reappraised). Mean reappraisal choice by condition is shown in Figure 1.

The strong main effect created by removing the default instruction suggests that default preferences played a powerful role in influencing participant choices. To further examine this effect, we took advantage of the fact that in Group 1 and 2, participants received different default instructions. When the default instruction was "watch," participants elected to keep the default in 84.7% of trials (meaning that they reappraised in only 15.3% of trials, which nearly exactly replicates Study 2). When the default instruction was "reappraise," participants elected to keep the default in 78.3% of trials (meaning that they reappraised in 78.3% of trials). Responses in these two default conditions were significantly different, $t(86) = 12.6$, $p < .001$.

Finally, as in Study 1 and 2, reappraisal increased posttrial affect ratings. The posttrial affect rating (higher numbers represent less negative ratings) was 4.51 for trials that were reappraised and 3.72 for trials that were not reappraised (i.e., watched); reappraise versus watch, $t(3518) = 12.67$, $p < .001$, $d = 0.42$. This difference in reported affect was not driven by the normative valence ratings of the stimuli that were selected for reappraisal (mean valence 3.03) versus those that were not (mean valence 3.19).

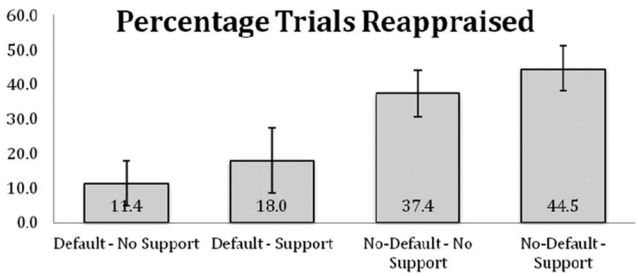

Figure 1. Mean reappraisal choice by condition. When watching was the default, the percentage of reappraisals was low. When the default was removed, the percentage of reappraisals significantly increased. Providing support did not yield a significant main effect. Error bars represent 95% confidence intervals.

General Discussion

It has often been assumed that healthy individuals reappraise whenever they need to—unless they are not aware of the benefits of reappraisal or they have instrumental goals that take priority. Collectively, this study series shows that even in decision contexts offering apparent hedonic benefits and requiring minimal costs, reappraisals are often not attempted due—at least in part—to default preferences.

Specifically, these studies showed that in a laboratory decision context reappraisals were implemented for only 16% of the available opportunities (Study 1). Reappraisal rates were low for both HI and LI images and were not affected by the availability of distraction as an alternative regulatory option (Study 2). Default preferences seemed to drive decisions to not reappraise. When defaults were removed, reappraisal rates increased by 278% (Study 3).

Emotion regulation choice is a rapidly growing area of research (Gross, 2014). Several papers (e.g., Sheppes et al., 2011; Sheppes, Scheibe, Suri, Radu, Blechert, & Gross, 2014) have examined the factors underlying regulatory decisions. These studies have shown that selection often varies by contextual demand. For example, healthy participants have been shown to use reappraisal in low emotional intensity contexts and distraction in high emotional intensity contexts (we were unable to assess this in Study 2 because of the very large number of trials for which participants chose neither form of regulation). However, the primary focus of these studies has been on affective drivers of context (e.g., intensity of stimuli, nature of regulatory options). In the present studies, we found that nonaffective contextual drivers—such as the designation of a default option—can play a large role in shaping regulatory choice.

In decision theory, defaults have been recognized to be important contextual variables that shape choice. Default behavior has been cited as mechanism underlying several decision contexts, including choices involving electrical service providers (Hartman, Doane & Woo, 1991), organ donation (Johnson & Goldstein, 2003), 401(K) plans (Beshears et al., 2006), investment portfolios (Ameriks & Zeldes, 2001), patient inertia (Suri, Sheppes, Schwartz & Gross, 2013), and choices in health plans (Samuelson & Zeckhauser, 1988). It is thus not altogether surprising that defaults would also play a role in decisions involving emotion regulation.

What is surprising—at least to us—is the strength of the effect exerted by default designations. In Study 2, the default instruction to watch equally shaped choice for HI and LI images. In Study 3, removing the default designation nearly tripled reappraisal rates.

In the context of everyday situations calling for explicit regulation, the default state—by definition—is to do nothing and experience the emotion. This study series suggests that many such everyday situations may go unregulated even though proactive regulation may have offered hedonic benefits.

Future studies must also evaluate the clinical implications of the above results. Prior work on emotion regulation and psychopathology has suggested that compared to healthy controls, people who suffer from psychological disorders tend to regulate their emotions

inadequately (e.g., Kring & Sloan, 2010). The present work suggests that the absence of emotion regulation may sometimes be driven by contextual variables—such as the presence of defaults. It is possible that there are intrinsic or environmental factors that create more inflexible default behavior in clinical populations.

One notable feature of these results is that even when default preferences are removed and reappraisal facilitation is provided, reappraisal rates remained below 50%, countering the common assumption that reappraisal is ubiquitous (John & Gross, 2007). It is possible that this result is driven by either a hidden cost of reappraisal that we have not investigated in Study 3, or by a counterintuitive benefit of feeling affect even though it is negative. Future studies are needed to investigate this issue.

Our studies were designed to get initial purchase on an immensely complicated question. We thus made several scope simplifications: we focused on reappraisals as a test case (and not other forms of emotion regulation), healthy controls (not patients), affect induced by negative images in a laboratory context (not the different categories of naturalistic affect encountered in daily life), cued regulatory instructions (not spontaneous regulation; Aldao, 2013), and conscious regulation (not automatic regulation; Gyurak, Gross & Etkin, 2011)). Further studies are required to examine these different contexts. Such studies may provide a deeper understanding of how and when people decide to regulate their emotions.

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Received January 26, 2014
Revision received March 18, 2014
Accepted April 30, 2014 ■