# Resisting the sirens of temptation while studying: Using reappraisal to increase focus, enthusiasm, and performance

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## ABSTRACT

One of the major obstacles in the learning process is temptation, which has the power to divert students from even their most important goals (e.g. getting a degree). In two studies, we tested the hypothesis that cognitive reappraisal could be used to successfully resist temptation. Participants had to memorize tedious material while being tempted by pictures pasted on the wall (Study 1) or by funny clips on the television (Study 2). In Study 1, compared to a control group, participants who were instructed to reappraise the task as an opportunity to improve their memory (1) were less tempted by the pictures, (2) maintained their enthusiasm for the task, and (3) showed better performance in a subsequent memory test. Study 2 replicated and extended the findings from Study 1, showing that cognitive reappraisal is effective whether the target of reappraisal is the temptation itself, or the longer term goal. Taken together, our findings provide compelling evidence that cognitive reappraisal (of either the task or the temptation) may be a useful tool for increasing students' task performance and enthusiasm.

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"*Learning is not something that happens to students;*

*it is something that happens by students*". (Zimmerman, 2001, p. 33)

For many students, going out for a drink with friends, surfing on the Internet, or watching television are temptations that can become real obstacles in the learning process. These temptations – and others like them – pose a real risk of diverting students from achieving even their most important goals (e.g. performing well on a test or getting a degree).

In such cases, it is important to note that temptation refers to "the desire to behave in a way that is expected to be regretted at a later time" (Magen & Gross, 2007, p. 246). Thus, the student fully knows that short-term gratification will be paired with long-term negative emotions. This is because the opposition between short-term and long-term rewards lies at the heart of temptation: if the student succumbs to temptation (e.g. goes out for a drink, watches TV), s/he will experience positive emotions in the short term (e.g. pleasure) but negative emotions in the long term (e.g. regret, guilt). In contrast, by focusing on study, s/he may experience negative emotions in the

short run (e.g. boredom, anxiety) but will experience positive emotions in the long run (e.g. pride). Therefore, academic success and sustained well-being are largely a function of the capacity to resist immediately available pleasure in order to obtain greater pleasure later on (Bembenutty & Karabenick, 2004).

Over the past few decades, researchers have sought to understand why people succumb to temptations and how this may be resisted (e.g. Bembenutty & Karabenick, 1998; Corno, 2004; Garcia, McCann, Turner, & Roska, 1998; Metcalfe & Mischel, 1999; Mischel & Ayduk, 2004; Zimmerman & Martinez-Pons, 1990). Four main strategies have been identified that are particularly relevant to students. First, students can *modify their situation*, that is, alter their physical and social context to make it compatible with their goals (e.g. Zimmerman, 2001); for instance, they can get rid of their TV during the exam session. Second, students can *physically or mentally withhold attention* from the temptation cues (e.g. Peake, Hebl, & Mischel, 2002); they can study in a room located far from the TV or concentrate hard in order to block out sounds from the TV. Third, students can use volitional control to *inhibit the dominant response* (e.g. McCann & Turner, 2004); they may decide to force themselves to continue studying rather than watch TV. Fourth, students can *simply recast or abandon the goal*; students who have been unsuccessfully pursuing a goal can simply decide to give it up in order to preserve their well-being and resources (e.g. Carver, 2004).

Although the approaches described above differ in many ways, they share one important feature, namely working *against* the need for immediate gratification, either by attempting to prevent the occurrence of temptation (situation/goal modification, attention control) or by

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overriding it (response inhibition; Magen & Gross, 2010). While these methods can be effective, they come at a cost (attention control and response inhibition both have cognitive costs; Fishbach, Friedman, & Kruglanski, 2003) and are not always applicable (e.g., it is not always possible to change one's goals or physical environment).

Recently, Magen and Gross (2007) proposed an alternative strategy to manage temptation, namely cognitive reappraisal. Cognitive reappraisal refers to changing the meaning of a situation in order to modify its emotional impact (Gross, 1998). Let us take an example. Imagine a student tempted to watch his favorite TV series the day before an important exam. As explained earlier, the temptation arises because the "wrong" goal (watching TV) elicits positive emotions (interest, pleasure), while the "right goal" (i.e. the one that maximizes long-term satisfaction and well-being: studying) elicits negative emotions (boredom or anxiety). Cognitive reappraisal can help resist temptation by modifying these contingencies. If I reappraise the situation as a test of willpower, watching TV becomes associated with negative emotions (e.g., shame; "I am a loser") while studying becomes associated with positive emotions (pride). Cognitive reappraisal thus modifies the way people represent the choice options: it increases the appeal of the "good choice" (i.e. the option that is aligned with long-term goals), while decreasing the appeal of the "wrong choice".

In a previous study that tested the value of cognitive reappraisal, participants took a math test while being tempted by entertaining comedy clips on TV (Magen & Gross, 2007). In the no-reappraisal condition, participants were simply asked to do their best at the math test. In the experimental condition, they were instructed to cognitively reappraise the situation as a "test of willpower." Findings indicated that, compared to participants in the control group, participants in the reappraisal group watched the comedy clips less, and experienced less pleasure when watching the clips.

While this study demonstrates that cognitive reappraisal is an effective strategy for resisting temptation, it is not clear how this cognitively-based strategy influences performance. It is possible that, because it decreases temptation, it increases learning performance. However, it is also conceivable that, because it relies on cognition, it leaves fewer resources available for the learning task, leading to impaired performance. This is a crucial question because a strategy that would help resist temptation at the cost of learning performance would be useless. A second question that has not yet been explored in the literature is whether some forms of reappraisal are preferable to others, particularly in a learning context. Theoretically, cognitive reappraisal can be achieved by either one or both of two means: by decreasing the value of the temptation or by increasing the value of the task. It remains to be determined if one of these two possibilities is superior to the other.

The goal of the present research is to address the foregoing issues, using an adaptation of Magen and Gross (2007)'s paradigm. In Study 1, students were required to study while being tempted by pictures pasted up on the wall. In Study 2, they were tempted by television. Study 1 tests the effect of cognitive reappraisal on (1) susceptibility to temptation, (2) enthusiasm for the task, and (3) performance. Study 2 aims to replicate the finding from Study 1, and extends them by determining whether it matters which aspect of the situation one chose as the primary target of reappraisal (i.e. the temptation or the task).

## 1. Study 1: cognitive reappraisal in learning context

Study 1 had students study tedious material in the presence of a very common temptation: images pasted up on the wall — like the pictures and posters with which students decorate their room. The interest of such a temptation is that it has the power to distract students without them knowing it. We hypothesized that, compared to a no-reappraisal control condition, task reappraisal would lead: (1) to less susceptibility to temptation, (2) to more enthusiasm for the task, and (3) to better performance.

### 1.1. Method

#### 1.1.1. Participants

Fifty-one undergraduate psychology students (42 women) participated in this experiment in exchange for course credit. They were recruited from the Université catholique de Louvain, Belgium. On average, participants were 18.8 years old ($SD = .97$ years).

#### 1.1.2. Procedure

Participants were tested individually in the laboratory. The cover story stated that the study was about "Association of ideas." In the first phase, participants had 10 min to learn information provided about 20 wines (vintage year, two aromas — Task 1). Participants then completed a questionnaire assessing enthusiasm and underwent a memory test about the wine task (Test 1).

Participants were then randomly assigned to the Control condition ($n = 23$) or Task reappraisal condition ($n = 28$). In the Control condition, instructions were "*Please, do your best at the next learning task.*" In the Task reappraisal condition, instructions were "*In order to do your best at the next learning task, I suggest you to envisage this task as an opportunity to train and improve your memory, which is an important key to success at the university.*"

After the instructions, participants were taken to another laboratory, where they were asked to learn information about 20 new wines (Task 2). Two pictures (10 by 5 in., taken from a Wechsler test as described in the measures section below) were pasted on the wall in front of the desk. The experimenter then left the laboratory. After 10 min, participants came back to the first laboratory and completed several measures: a questionnaire assessing enthusiasm, a memory test (Test 2), a memory questionnaire about the two pictures (Susceptibility to temptation measure), a visual memory test, and a manipulation check.

#### 1.1.3. Measures: manipulation check variables

##### 1.1.3.1. Visual memory.
A picture (i.e. the Family picture "Meal" from the Wechsler Memory Scale-Third Edition, Wechsler, 2001) was presented to the participants during 30 s, and then removed. Afterwards they had to answer three questions about the picture: "*Who was in the picture? What was the location of each character? What were they doing?*" An overall score was calculated (1 point for each detail recalled; maximum = 12 points).

##### 1.1.3.2. Task reappraisal.
Participants rated their agreement with the following item on a 7-point scale ranging from 1 (not at all) to 7 (very much): "*While I was studying, I thought of the benefits of this task for my memory.*" In order to ensure that this questions did not act as a reappraisal manipulation, we asked it at the end of the experiment about the two tasks.

#### 1.1.4. Measures: dependent variables

##### 1.1.4.1. Susceptibility to temptation.
Participants answered three questions analogous to those regarding the Visual memory test (described above) concerning the two pictures on the wall (i.e. the Family pictures "Shop" and "Country" from the Wechsler Memory Scale-Third Edition, Wechsler, 2001) (maximum = 24 points).

##### 1.1.4.2. Enthusiasm for the task.
After each task (and before the performance test), participants rated the extent to which they experienced various emotional states, using a 7-point Likert scale from 1 (not at all) to 7 (very much). The target item was "enthusiasm." Other items were used as distractors.

##### 1.1.4.3. Performance.
Performances on the learning tasks were measured using a paper and pencil association memory test (Tests 1 and 2). The 20 wines studied were presented in a mixed order and

participants had to note, for each of them, the vintage year and two aromas. An overall score was calculated (1 point for each detail recalled; maximum = 20 points).

### 1.2. Results

#### 1.2.1. Manipulation check analyses

Independent t-tests showed that the two groups did not differ in baseline associative memory, $t(49) = .17$, *ns*, or visual memory, $t(49) = 1.12$, *ns*.

To test whether our manipulation had the intended effects, we conducted repeated-measures ANOVAs on the reappraisal item, with condition (Control, Task reappraisal) as a between-subjects factor, and time (premanipulation vs. postmanipulation) as a within-subjects factor. As expected, analyses yielded a significant Condition × Time interaction on task reappraisal, $F(1, 49) = 12.54$, $p < .01$, $\eta^2_p = .20$. The change of appraisal (Reappraisal Task 2 minus reappraisal Task 1), was significantly greater in the Reappraisal group ($M = 4.57$, $SD = 1.81$) than in the Control group ($M = 3.87$, $SD = 1.74$), $F(1, 50) = 12.54$, $p < .01$.

#### 1.2.2. Susceptibility to temptation

A similarly structured ANOVA showed that the Control group ($M = 7.54$, $SD = 7.14$) recalled more information about the two pictures pasted on the wall than Reappraisal group ($M = 3.07$, $SD = 4.50$), $F(1, 50) = 7.42$, $p < .01$, $d = .13$, suggesting that participants in the Control group spent more time looking at the pictures than participants in the Reappraisal group. The cognitive reappraisal manipulation was thus effective in reducing temptation.

#### 1.2.3. Enthusiasm for the task

A similarly structured ANOVA was used to assess the effects of reappraisal on enthusiasm. There was no main effect for condition, $F(1, 49) = .12$, *ns*, and no main effect for time, $F(1, 49) = .41$, *ns*. However, there was a significant Condition × Time interaction, $F(1, 49) = 4.95$, $p < .05$, $\eta^2_p = .10$. As shown in Fig. 1, changes in enthusisasm for the task over time differed across groups: enthusiasm tended to decrease in the Control group, $t(22) = 1.42$; *ns*, while it tended to increase in the Reappraisal condition, $t(27) = -1.83$; *ns*.

#### 1.2.4. Task performance

A similarly structured ANOVA yielded no main effect of condition, $F(1, 49) = 1.01$, *ns*, but a significant main effect of time, $F(1, 49) = 7.75$, $p < .01$, $\eta^2_p = .14$. Most crucially, there was a significant Condition × Time interaction, $F(1, 49) = 6.51$, $p < .05$, $\eta^2_p = .12$. Paired samples t-test indicated that the Reappraisal group showed an increase in

performance (Difference: $M = 3.5$, $SD = 4.44$; $t(27) = -4.17$, $p < .001$, $d = .79$) while the Control group did not (Difference: $M = .15$; $SD = 4.92$; $t(22) = -.15$, *ns*). Thus, cognitive reappraisal was effective in improving performance (see Fig. 2).

#### 1.2.5. Summary

Compared to the Control group, participants who reappraised the learning task as an opportunity to improve their memory (1) spent less time viewing tempting pictures on the wall, (2) maintained their enthusiasm for the task, and (3) showed better task performance. These findings suggest that reappraisal does not bear significant cognitive costs or that, if it does, these are not sufficient to impair learning performance. Taken together, these results confirm the relevance of cognitively reappraising *the task*.

## 2. Study 2: task reappraisal or temptation reappraisal in learning context?

The main goal of Study 2 was to examine whether it is better to reappraise the *task* in order to increase its appeal (as was done in Study 1) or reappraise the *temptation* in order to decrease its appeal. We therefore compared three conditions (control, reappraisal of the temptation, reappraisal of the task) on three dependent variables: susceptibility to temptation, enthusiasm for the learning task, and task performance.

We hypothesized that: (1) temptation reappraisal would lead to less susceptibility to temptation compared with the other groups; and (2) task reappraisal would lead to more enthusiasm for the task than the two other groups, and (3) both temptation and task reappraisal would lead to better performance compared with the Control group.

### 2.1. Method

#### 2.1.1. Participants

Sixty-six undergraduate psychology students (63 women) participated in this experiment in exchange for course credit. They were recruited from the Université catholique de Louvain, Belgium. On average, participants were 19.8 years old ($SD = 3.0$ years).

#### 2.1.2. Procedure

Participants were told that the study was about "the effects of amusement on cognitive performance." Sessions were conducted individually. The first task provided us with an independent measure of
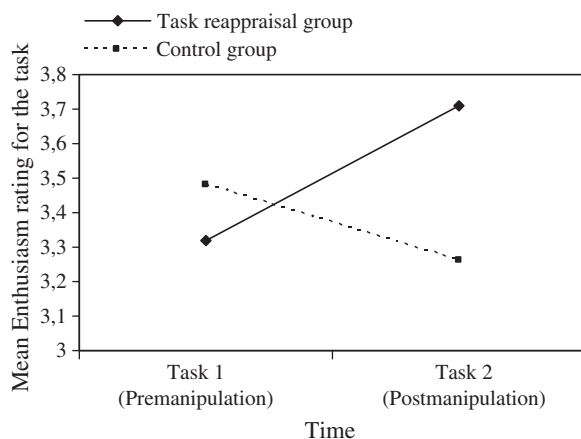


**Fig. 1.** Enthusiasm for the task before and after manipulation in each group (study 1).
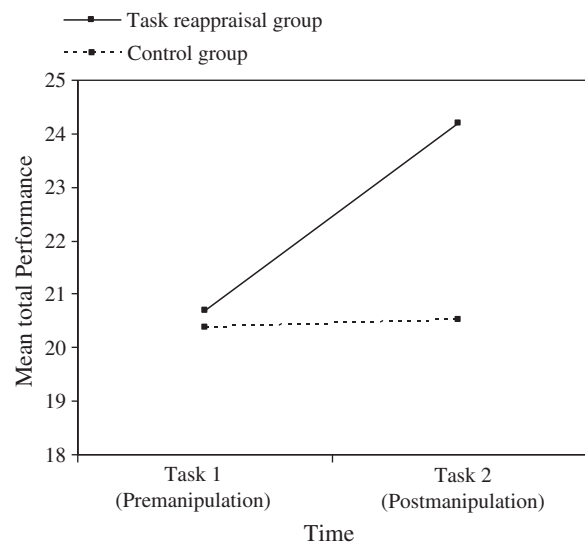


**Fig. 2.** Performance before and after manipulation in each group (study 1).

the participants' association memory *in the absence of temptation*. Specifically, participants had 5 min to learn the information provided about 10 paintings (title, artist, and year) (Baseline test). The participants then viewed a funny 1-minute clip on TV and rated their amusement level. In order to reduce the variance in participants' emotional state, a 1-minute relaxation session took place immediately after the amusement rating.

Participants then had 10 min to study 20 new paintings while the television displayed *La nuit des publivores 2006* (a show presenting the year's funniest advertisements from 60 countries). The television was placed to the left of the participants at a distance of 1.5 m. Participants had to turn their heads at an angle of 90° to look at the television. Following the studying session, the subjects completed a memory test (Test 1), which provided us with an independent measure of their ability to study *in the presence of a temptation* (i.e. divided attention). They also completed a questionnaire assessing their enthusiasm for the task.

Participants were then randomly assigned to one of three conditions: Control condition ($n = 20$), Temptation reappraisal ($n = 25$), or Task reappraisal ($n = 21$). In the Control condition, instructions were "*Please, do your best at the next learning task*." In the Temptation reappraisal condition, instructions were "*In order to improve your memorization ability during the next learning task, I suggest you consider this task as a test of willpower..*" In the Task reappraisal condition, instructions were "*In order to improve your memorization ability during the next learning task, I suggest you take this task as an opportunity to improve your memory, which is an important key to success at university.*"

The post-manipulation learning task (Task 2) that followed the instructions was similar to Task 1: the television displaying funny advertisements was turned on, and participants had 10 min to study 20 new paintings. Afterwards, subjects completed a questionnaire assessing their enthusiasm, a memory test (Test 2), and a manipulation check. All participants were unaware that a camera (allowing us to measure the time spent peeking at the TV) was hidden in the laboratory. The experimenter left the laboratory during the two main tasks. Participants were informed that the best performer would receive a 65 dollars.

### 2.1.3. Measures: manipulation check variables

*2.1.3.1. Association memory.* Association memory was evaluated using paper and pencil test. The 10 paintings were presented in a mixed order and participants had to note, for each of them, their title, the artist's name, and the year of execution. An overall score was calculated (1 point for each detail recalled; maximum = 30 points). The score constituted the measure of baseline association memory.

*2.1.3.2. Divided attention.* Two measures enabled us to assess the effects of our divided attention manipulation: the memory test score (Test 1) and the susceptibility to temptation measure. The memory test was similar to the association memory test (with 20 new paintings). Susceptibility to temptation was measured at Task 1 as the time spent watching TV (in seconds).

*2.1.3.3. Temptation perception.* In order to ensure that the comedy film segment constituted a temptation, we asked participants to rate on a 7-point Likert scale (from 'not at all' to 'very much') how much they enjoyed the 1-minute sample of *La nuit des Publivores*. Two other 10-minute sequences were used for the last part of the experiment.

*2.1.3.4. Task and temptation reappraisal measures.* Participants rated their agreement with two items on a 7-point scale ranging from 1 (not at all) to 7 (very much): "*While I was studying, I thought of the situation as a test of willpower*" (Temptation reappraisal) and "*While I was studying, I thought of the benefits of this task for my memor*" (Task reappraisal). In order to ensure that the presentation of these questions

did not serve as a reappraisal manipulation, participants were asked at the end of the experiment about Tasks 1 and 2.

### 2.1.4. Measures: dependent variables

*2.1.4.1. Susceptibility to temptation.* Participants were covertly videotaped during the two main task sessions. The amount of time in seconds spent peeking at the TV was considered as a measure of their susceptibility to temptation.

*2.1.4.2. Enthusiasm for the task.* After each task (and before the performance test), participants rated the extent to which they were experiencing various emotional states, using a 7-point Likert scale from 1 (not at all) to 7 (very much). The target item was "enthusiasm." Other items were used as distractors.

*2.1.4.3. Performance.* Performances in the learning tasks (Tests 1 and 2) were similar to the association memory test (with 20 new paintings).

## 2.2. Results

### 2.2.1. Manipulation check analyses

One-way ANOVAs showed that at baseline, there was no difference among groups in associative memory, $F(2, 65) = .61$, *ns*, or divided attention (Memory test score: $F(2, 65) = .84$, $p = .44$, *ns*; Susceptibility to temptation: $F(2, 65) = .06$, *ns*). Moreover, all pairwise contrasts in the three conditions were not significant ($p > .22$). Thus, the three conditions were equivalent regarding their baseline ability to study without and in the presence of temptation.

In order to ensure that participants in each of the three instructional groups found the film comparably engaging, we compared responses on the item measuring temptation perception ($M = 4.84$, $SD = 1.39$) to the midpoint of the 7-point Likert scale (3.5). TV can be considered as a temptation because participants are, on average, responding significantly higher than the middle (neutral) point of the scale, $t(63) = 7.71$; $p < .001$, $d = .17$.

In order to check whether our manipulation had the intended effects, we conducted repeated-measures ANOVAs on each of the reappraisal items, with condition (Control, Temptation reappraisal, Task reappraisal) as a between-subjects factor, and time (premanipulation vs. postmanipulation) as a within-subjects factor. As predicted, analyses of the temptation item yielded a significant Condition × Time interaction, $F(2, 63) = 5.4$, $p < .01$, $\eta^2_p = .15$. Before the manipulation (Task 1), the three groups were similar in their appraisal of the temptation, $F(2, 65) = .68$, *ns*. After the manipulation (Task 2), participants in the Temptation reappraisal group ($M = 4.76$, $SD = 1.90$) viewed the situation as more of a test of willpower than the two other groups: Task reappraisal group: $M = 3.62$, $SD = 2.01$, $t(63) = 2.17$, $p < .05$, $d = .22$; Control group: $M = 2.50$, $SD = 1.28$, $t(63) = 4.24$, $p < .001$, $d = .47$.

As expected, analyses also yielded a significant Condition × Time interaction on the task reappraisal item, $F(2, 63) = 15.12$, $p < .001$, $\eta^2_p = .32$. After the manipulation (Task 2), participants in the Task reappraisal group ($M = 4.38$, $SD = 2.11$) considered the future benefits of the task to be greater than participants in the two other groups: Temptation reappraisal group: $M = 3.08$, $SD = 2.00$, $t(63) = -2.21$, $p < .05$, $d = .23$; Control group: $M = 1.95$, $SD = 1.85$, $t(63) = 3.91$, $p < .001$, $d = .48$.

### 2.2.2. Susceptibility to temptation

In order to test the effects of cognitive reappraisal on susceptibility to temptation, we performed repeated-measures ANOVAs on our measure of temptation, entering condition (Control, Temptation reappraisal, Task reappraisal) as a between-subjects factor, and time (premanipulation vs. postmanipulation) as a within-subjects factor. Results revealed no main effect of condition, $F(2, 63) = 1.66$, *ns*, or time, $F(1, 63) = .06$, *ns*. However, as expected, the results showed a

significant Condition×Time interaction, $F(2, 63) = 3.63$, $p < .05$, $\eta^2_p = .10$, indicating that changes in susceptibility to temptation over time differed across groups (see Fig. 3). Paired sample t-tests revealed that, when Time 2 was compared to Time 1, participants tended to spend more time peeking at the TV in the Controlgroup (Difference: $M = 5.22$, $SD = 15.991$; $t(19) = -1.46$, *ns*), an equal amount of time peeking at the TV in the Task reappraisal group (Difference: $M = .00$, $SD = 9.96$; $t(20) = -.00$, *ns*) and less time peeking at the TV in the Temptation reappraisal group (Difference: $M = -4.18$, $SD = 8.40$; $t(24) = 2.49$, $p < .05$, $d = .50$). As expected, the temptation manipulation was the only factor to produce a significant *decrease* in susceptibility to temptation.

### 2.2.3. Enthusiasm for the task

Using a similarly structured ANOVA, we examined the effects of our manipulations on task enthusiasm. There was no main effect of condition, $F(2, 63) = .06$, *ns*, or time, $F(1, 63) = .28$, *ns*. However, there was a significant Condition×Time interaction, $F(2, 63) = 4.09$, $p < .05$, $\eta^2_p = .12$. As shown in Fig. 4, changes in enthusisasm over time differed across groups. Paired samples t-tests indicated that, while the Control group experienced a drop in enthusiasm (Difference: $M = -.75$, $SD = 1.33$; $t(19) = 2.52$, $p < .05$, $d = .56$), both the Temptation reappraisal group (Difference: $M = .16$, $SD = 1.31$; $t(24) = -.61$, *ns*) and the Task reappraisal group (Difference: $M = .33$, $SD = 1.28$; $t(20) = -1.20$, *ns*) maintained their initial levels of enthusiasm. Compared to the Control group, enthusiasm was greater in the Task reappraisal group, $t(63) = 2.65$, $p < .05$, $d = .20$, and in the Temptation reappraisal group, $t(63) = 2.32$, $p < .05$, $d = .23$. But while we expected Task reappraisal to be more effective in preserving enthusiasm for the task than Temptation reappraisal, no significant differences emerged between the two groups, $F(1, 45) = .20$, *ns*. Therefore, both forms of cognitive reappraisal appear similarly effective in preserving enthusiasm for the task.

### 2.2.4. Task performance

Using a similarly structured ANOVA, we examined the effects of our manipulations on task performance. Analyses yielded no main effect of condition, $F(2, 63) = 1.22$, *ns*, but a significant main effect of time, $F(1, 63) = 20.80$, $p < .001$, $\eta^2_p = .25$, indicating that, overall, performance improved over time. Most crucially, there was a significant Condition×Time interaction, $F(2, 63) = 3.81$, $p < .05$, $\eta^2_p = .11$ indicating that changes in performance over time differed across groups (see Fig. 5). Paired samples t-tests indicated that the Temptation reappraisal
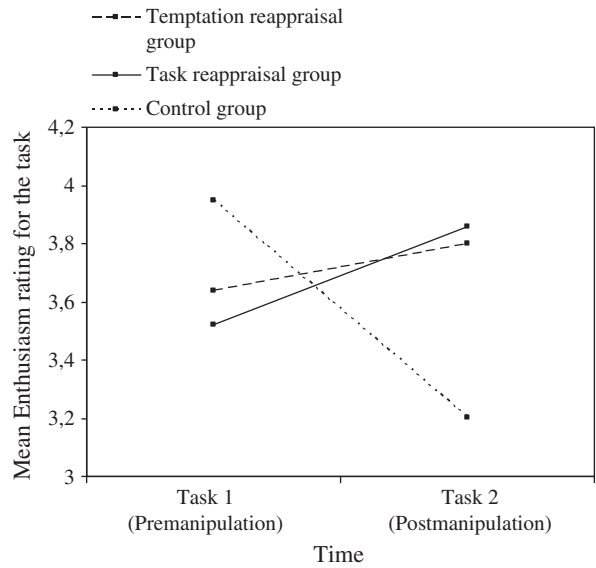


**Fig. 4.** Enthusiasm for the task before and after manipulation in each group (study 2).

group (Difference: $M = 3.82$, $SD = 4.91$; $t(24) = -3.89$, $p < .01$, $d = -.78$) and the Task reappraisal group (Difference: $M = 4.67$, $SD = 4.82$; $t(20) = -4.43$, $p < .001$, $d = -.97$) showed enhanced performance while the Controlgroup did not, Difference: $M = .40$; $SD = 6.05$; $t(19) = -.30$, *ns*. As expected, the two forms of reappraisal were equally effective regarding performance, $F(1, 45) = .35$, *ns*.

### 2.2.5. Summary

Compared to a Control group, cognitive reappraisal (1) decreased susceptibility to temptation, (2) maintained enthusiasm for the task, and (3) improved performance at the learning task. While this study clearly demonstrates the added value of reappraisal in the learning process, it did not reveal any clear superiority of one form of reappraisal over another. Indeed, while Temptation reappraisal was slightly better than Task reappraisal in managing temptation, both forms of reappraisal were equally effective in maintaining enthusiasm and improving performance.
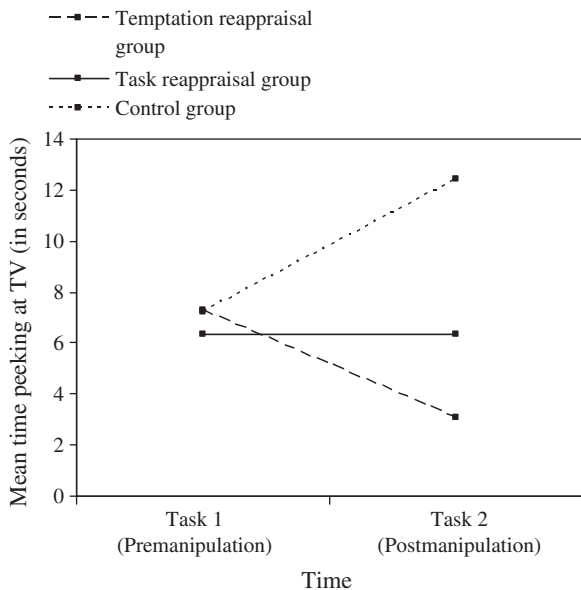


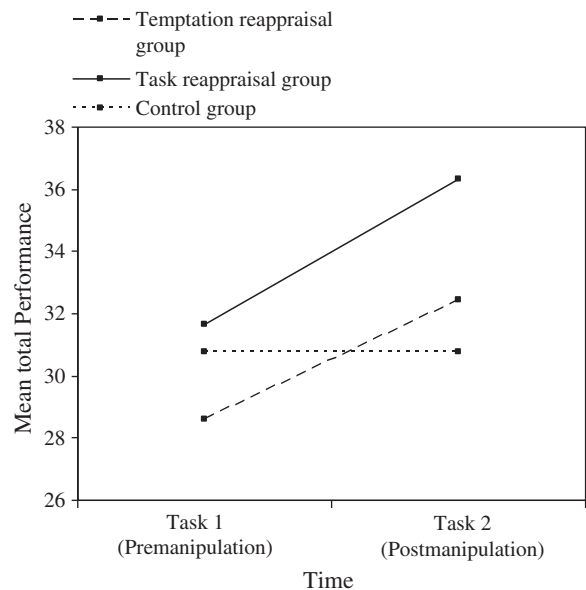**Fig. 3.** Time peeking at the TV before and after manipulation in each group (study 2).



**Fig. 5.** Performance before and after manipulation in each group (study 2).

## 3. General discussion

Temptation is an important obstacle to academic achievement (Duckworth & Seligman, 2005). How can this obstacle be overcome? In two studies, we tested a novel approach to overcoming temptation, namely cognitively reappraising the situation so as to modify the value of either the task (Task reappraisal) or the temptation (Temptation reappraisal). To this end, we asked participants to perform a tedious task (i.e. studying relatively boring material) while faced with a temptation that was subtle (i.e. pictures pasted on the wall — Study 1) or very hard to ignore (i.e. funny videos — Study 2). Some of the participants were instructed to reappraise the situation, while the others served as controls.

Compared with the Control group, participants who used either form of reappraisal were less distracted, showed greater enthusiasm for the learning task, and did better at the task. In Study 2, although we expected both forms of reappraisal to be equally effective in enhancing performance, we anticipated that they might act slightly differently. In particular, we anticipated that the Temptation reappraisal group would be less distracted by the TV than the Task reappraisal group, and that the latter would be a more enthusiastic about the task than the former. That is, temptation reappraisal would particularly influence temptation-related processes (i.e. time peeking at the TV), while task reappraisal would particularly influence task-related processes (i.e. enthusiasm for the task), both resulting in enhanced task performance. Although the group means are indeed consistent with such a prediction, the differences were not significant. Future research should seek to further clarify the processes underlying the effects of different forms of reappraisal on task performance.

The fact that cognitive reappraisal increased performance is particularly remarkable as it confirms that this strategy does not bear significant cognitive costs (Richards & Gross, 2000). If it had, it would have reduced temptation *at the cost of performance*, which was not the case in our studies. Thus, self-regulation through cognitive reappraisal seems to have benefits that are emotional (in terms of maintaining enthusiasm), behavioral (in terms of reducing the impulse to succumb to temptation), and also cognitive (in terms of improving performance). This finding may explain why Leroy and Grégoire (2007) recently found that the recurring use of reappraisal was positively correlated with academic performance.

Despite these encouraging results, some limitations have to be acknowledged. First, both our manipulation check measure and our enthusiasm measure consisted of only one item. A second limitation is that we externally induced cognitive reappraisal and focused on group-level effects rather than individual differences. It is not clear whether all students are equally able to use reappraisal, or whether personality or cognitive ability moderates this ability. Similarly, it is not known whether cognitive reappraisal is equally effective in different populations. Some students (e.g. those with attention and/or hyperactivity disorders) may possibly benefit less, or more, from reappraisal. A third limitation is that the duration of the effect has not yet been tested. Future studies are needed to determine how long the effect of a given occurrence of reappraisal lasts (i.e. an hour, a day, etc.) and

which are the long-term correlates of dispositional reappraisal (e.g. school dropout, grade point average).

The present pair of studies clearly suggests that cognitive reappraisal deserves a place among the set of available tools used to promote academic achievement. By making the temptation less attractive and the task more appealing, cognitive reappraisal seems to represent a powerful aid to goal striving. Parents, teachers and educators can also use it in order to help students achieve their academic goals, and to more successfully resist the many sirens of temptation that regularly derail the plans of many well-intentioned students.

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