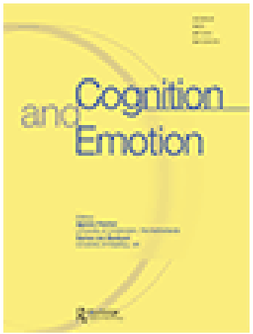

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Yes I can: Expected success promotes actual success in emotion regulation

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ABSTRACT

People who expect to be successful in regulating their emotions tend to experience less frequent negative emotions and are less likely to suffer from depression. It is not clear, however, whether beliefs about the likelihood of success in emotion regulation can shape actual emotion regulation success. To test this possibility, we manipulated participants' beliefs about the likelihood of success in emotion regulation and assessed their subsequent ability to regulate their emotions during a negative emotion induction. We found that participants who were led to expect emotion regulation to be more successful were subsequently more successful in regulating their emotional responses, compared to participants in the control condition. Our findings demonstrate that expected success can contribute to actual success in emotion regulation.

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Emotion; emotion regulation; beliefs; efficacy; expectancies

Successful emotion regulation is a critical component of mental health and adjustment (Gross, 2013; Kring & Sloan, 2010; Vingerhoets, Nyklicek, & Denollet, 2008). A growing awareness of this fact has led to a concerted effort to understand the factors that promote successful emotion regulation. In this investigation, we tested whether the expectation of success in emotion regulation could contribute to actual emotion regulation success.

Beliefs about the likelihood of certain outcomes can influence related behaviour. Direct evidence for this has been provided, in part, by research on self-efficacy and by research on response expectancy (see Kirsch, 1985a). Self-efficacy refers to individuals' beliefs about their personal capacities or skills (Bandura, 1977). Self-efficacy has been linked to performance in multiple domains, including writing (e.g., Pajares, 2003), learning (e.g., Zimmerman, Bandura, & Martinez-Pons, 1992) and performance at work (e.g., Sadri & Robertson, 1993). Furthermore, there is evidence that self-efficacy plays a causal role in shaping desired outcomes. For example, Cervone and Peake (1986) manipulated self-efficacy in verbal tasks and found that it influenced subsequent performance in verbal tasks, such as anagrams. Similarly, manipulating self-efficacy in creativity enhanced actual creativity (Sanna & Pusecker, 1994).

People differ not only in the beliefs they have about their own abilities, but also in their beliefs about the likelihood of future events (i.e., expectancies). Response expectancies refer to beliefs about the likelihood of change in self-relevant outcomes following various interventions (Kirsch, 1985b). Response expectancies have been shown to influence both physiological and psychological states. For example, people who expected hypnosis to be effective were more susceptible to hypnosis (Kirsch, 1985b). Similarly, some of the placebo effects may be driven by response expectancies (Stewart-Williams & Podd, 2004).

Some correlational evidence has also linked beliefs about the likelihood of desirable outcomes to successful emotion regulation. In particular, Bandura and his colleagues found that emotion regulation self-efficacy

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was prospectively related to less depression and to more prosocial behaviour (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003; Caprara et al., 2008). Similarly, Tamir, John, Srivastava, and Gross (2007) found that self-efficacy in emotion regulation, as measured among college students at the beginning of freshmen year, was associated with less negative emotions, more positive emotions, higher psychological well-being and lower levels of depression at the end of freshman year (see also Goldin et al., 2012). Self-efficacy in emotion regulation also mediated the relations between implicit beliefs about emotions and adaptive emotional outcomes. These studies establish the relation between self-efficacy in emotion regulation as measured by self-report and self-reported emotional outcomes.

Researchers have also found positive correlations between response expectancies in emotion regulation and emotional outcomes. For instance, Catanzaro (1996) found that students who expected to be more successful in regulating their negative emotions coped better with test anxiety and performed better in the test itself. Similarly, Catanzaro and Mearns (1990) found that people who expected to be more successful in regulating their negative emotions had less depressive symptoms (for a review, see Catanzaro & Mearns, 1999).

Together, these lines of research lead to the conclusion that beliefs about the likelihood of success in emotion regulation are positively associated with desirable emotional outcomes. However, no research to date has tested whether such beliefs play a causal role in the efficacy of actual or observed emotion regulation. This leaves open several potential explanations of the existing findings, which are not mutually exclusive. One possibility is that people who experience more positive emotions, less negative emotions and are psychologically healthier also expect emotion regulation to be more successful.

Another possibility is that people who are generally more successful in regulating their emotions come to expect emotion regulation to be more successful (see Silver, Mitchell, & Gist, 1995, for a similar argument regarding self-efficacy in psychometric exams). According to this possibility, people who over time have experienced successful emotion regulation formed an expectancy that they would be able to effectively regulate their emotions in the future.

A third possibility is that the expectation that emotion regulation would be more successful independently contributes to success in emotion regulation. People who believe they are likely to be more successful in emotion regulation end up regulating their emotions more effectively, as a consequence. This possibility builds on the assumption that beliefs about the likelihood of outcomes in emotion regulation operate in a manner that is similar to their operation in other domains so that they increase the likelihood of the expected outcome (e.g., Bandura, 1977; Cervone & Peake, 1986; Sanna & Pusecker, 1994).

All three possibilities have merit and may contribute to the associations between beliefs about the likelihood of success in emotion regulation and successful emotion regulation. The current investigation, however, focuses on the third possibility, in particular. Specifically, we tested whether expected success in emotion regulation increases regulation effectiveness. To test this possibility, we manipulated such beliefs and assessed the degree to which people were subsequently effective when regulating their emotions in response to negative stimuli. We expected people who expected emotion regulation to be more successful to consequently be more effective in emotion regulation.

To manipulate expected success in emotion regulation while minimising experimental demand, we adapted a validated procedure in which participants are given false information about the side effects of a placebo drug (Manucia, Baumann, & Cialdini, 1984). The study was presented as testing the effects of a drug, and we informed participants that the drug has a side effect that involves increased emotional control (vs. not). Participants rated their concurrent emotions, viewed an unpleasant film clip before and after taking the placebo drug, and rated their emotional reactions to the clips.

To ensure that the information about the drug did not affect participants' feelings, participants also rated their emotional experiences immediately after they received information about the drug, but before they watched the negative clips. To ensure that conditions differed in emotion regulation and not in emotion reactivity, participants watched one clip in which they were asked to respond naturally, and then a second clip in which they were instructed to regulate their emotions.[1] Emotional experiences

[1]We also measured social desirability (Crowne & Marlowe, 1960). However, we do not report analyses with social desirability scores, because due to technical difficulties, scores on this measure were recorded for only some of the participants.

were measured at baseline, after watching the first clip and after watching the second clip. Compared to participants in the control condition, we expected participants who were led to believe they are likely to be more successful in regulating their emotions to actually be more successful in regulating their emotions when instructed to do so (i.e., in response to the second clip). We did not expect participants to differ in their baseline emotional experiences or in their spontaneous emotional reactions (i.e., in response to the first clip).

Method

Participants

Participants were 41 American undergraduate students (30% male, M_{Age} = 18.80, SD = 1.22, Range 17–21 years), who received monetary compensation for participating. No participants were excluded from the analyses.[2]

Materials

Film clips

To induce negative emotions, we used two 3-minute film clips, depicting peaceful demonstrations that are aggressively subdued by the police. The first clip was taken from the movie *Born on the 4*th *of July* (BFJ) and the second clip from the movie *A Dry White Season* (DWS). These clips were pre-tested in a larger validation study (see Rottenberg, Ray, & Gross, 2007), in which participants (N = 30 for BFJ, N = 34 for DWS) rated how much (0 = "not at all"; 8 = "extremely") they felt happiness and several negative emotions (*anger*, *contempt*, *fear*, *sadness*, *pain* and *disgust*; α = .90) when watching the clips. Participants in the pre-test rated these and other clips in different combinations in a random order. A repeated-measures ANOVA with emotion (positive vs. negative) as a within-subject factor and clip (BFJ vs. DWS) as a between-subjects factor confirmed that both clips elicited more negative emotions (M = 3.34, SE = 0.34 for BFJ, and M = 3.63, SE = 0.32 for DWS) than positive emotions (M = .27, SE = .14 for BFJ, and M = .32, SE = .13 for DWS), $F(1, 60) = 160.28$, $p < .001$. In the pre-test, the clips did not differ in their emotional impact, Fs < 1.

Emotional experiences

Participants rated the extent to which they felt various emotions (1 = "not at all"; 7 = "extremely"). To assess positive emotional experiences, we averaged across ratings of *amused*, *happy*, *joyful* and *pleased* (α = .85 for baseline, α = .74 for BFJ and α = .83 for DWS). To assess negative emotional experiences, we averaged across ratings of *afraid*, *angry*, *annoyed*, *confused, frustrated*, *guilty*, *shameful*, *anxious*, *nervous*, *tense, tired*, *worried* and *sad* (α = .89 for baseline, α = .89 for BFJ and α = .94 for DWS).[3]

Procedure

The study was conducted with one participant at a time. Participants were contacted prior to the experimental session to inform them that the study examines the cognitive effects of a drug and that the drug has been found safe to use. Upon arriving at the laboratory, an experimenter wearing a white lab coat greeted the participants, and told them that the study examines the effects of a drug called Bramitol on memory. In order to test the effects of this drug, they would complete memory tasks before and after taking the drug.

Participants were informed that Bramitol is safe and has few side effects, one of which is dryness of the mouth. Participants were randomly assigned to one of two conditions. Participants in the expected success condition (n = 22) were told that another common side effect involves enhanced emotion control. Participants in the control condition (n = 19) were informed of no additional side effects. Participants then rated their baseline emotional experiences. Next, they watched the first clip, *BFJ*, and rated their emotional experiences while watching the clip. Additionally, to support our cover story, participants answered five multiple choice questions that asked about their memory of the clip they watched (e.g., "What was written on the sign to the right of the first speaker?").

After watching the first clip, participants began the next phase of the study, which included the actual administration of the drug, followed by a second clip. As a manipulation check, participants were told that before taking the drug, they needed to list its possible side effects (i.e., "What are the primary side

[2]Sample size was determined following a power analysis, using the effect size in Manucia et al. (1984).

[3]Emotion items and ratings scales were not identical in the pre-test and in the experiment, because we sought to include a broader range of emotion items in the study than the limited range that was included in the pre-test. We also used a scale that has been commonly used when measuring emotional experience in emotion regulation studies (e.g. Richards & Gross, 2000).

effects of Barmitol? Check all that apply: (1) Dryness of mouth; (2) Influences emotional experiences; (3) Impaired emotional control; (4) Enhanced emotional control; (5) No emotional side effects"). Participants were then instructed to swallow a small white pill, identified as Bramitol, which in actuality was a pill of Vitamin C. Participants waited for 2 minutes, presumably to allow the drug to take effect. They then watched the second clip, *DWS*. They were told that since emotional responses interfere with memory, they should try to minimise the emotional impact of the clip. Participants watched the second clip, rated their emotional experiences while watching the clip, the extent they tried to minimise their emotional reaction to the clip and how successful they were in doing so (1 = "not at all", 7 = "extremely"). Participants were then probed for suspicion. Specifically, they were asked what they thought the study was about, and whether anything about this study seemed unusual or suspicious. They were then fully debriefed.

Results

All but three participants described the side effects of the drug accurately, indicating that they understood and remembered the expected side effects of the drug. None of the participants identified the true purpose of the study.

To test whether participants followed our regulation instructions, we examined their reported attempts to regulate their emotions in response to both clips. We ran a repeated-measures ANOVA with condition (expected success vs. control) as a between-subjects factor, and time (first clip, second clip) as a within-subject factor, with attempted regulation as the dependent variable. As expected, all participants reported trying harder to regulate their emotions when watching the second clip ($M = 5.53$, SE = 0.23) than when watching the first clip ($M = 2.22$, SE = 0.22), $F(1, 35) = 131.92$, $p < .001$, partial $\eta^2 = .79$. This effect was not qualified by condition and no other effects were significant, Fs < 1. This suggests that our regulation instructions were effective and that participants in both conditions tried harder to regulate their emotions when explicitly asked to do so.

Next, we tested whether participants differed in their perceived success in regulation. We predicted that participants in both conditions would try equally hard to regulate their emotions in response to the second clip, but that participants who expected to succeed will believe they were more successful. To test this, we ran the same analysis described above, using perceived success as the dependent measure. As expected, we found a significant time × condition interaction, $F(1, 39) = 6.09$, $p = .018$, partial $\eta^2 = 0.14$. Whereas participants in the control condition considered themselves equally successful in regulating their emotions when watching the first clip ($M = 3.63$, SE = 0.40) and second clip ($M = 3.79$, SE = 0.44), $F < 1$, participants in the expected success condition considered themselves more successful in regulating their emotions when watching the second clip ($M = 4.68$, SE = 0.41) than the first clip ($M = 2.91$, SE = 0.37), $F(1, 39) = 15.82$, $p < .001$, partial $\eta^2 = .29$. This interaction qualified a main effect, $F(1, 39) = 8.70$, $p = .005$, partial $\eta^2 = 0.18$, such that across conditions participants felt more success at regulating their emotions when watching the second ($M = 4.24$, SE = 0.30) than the first ($M = 3.27$, SE = 0.27) clip. To test whether participants were accurate in their perceived success, we computed the difference between the negative and the positive emotional experiences in each film and subtracted the change in positive emotions from the change in negative emotions. This measure of success in emotion regulation was positively correlated with self-reported ratings of perceived success in emotion regulation, $r(39) = .35$, $p = .025$.

To test whether participants in the expected success condition were actually more successful at regulating their emotions, we ran a repeated-measures ANOVA with condition (expected success vs. control) as a between-subjects factor, and emotions (positive vs. negative) and time (baseline, first clip, second clip) as two within-subject factors.[4] Confirming the emotional impact of the negative clips, we found a significant Emotion × Time effect, $F(2, 70) = 45.90$, $p < .001$, partial $\eta^2 = .57$.

Most importantly, as predicted, we found a significant Condition × Time × Emotion interaction, $F(1, 70) = 3.50$, $p = .035$, partial $\eta^2 = .09$. As shown in Figure 1 and confirmed in follow-up tests of simple effects, participants in the two conditions did not differ from each other in negative emotions (averaged across all negative items) at baseline (control condition: $M = 2.07$, SE = 0.22; expected success condition: $M = 2.14$, SE = 0.20), $d = 0.07$, $p = .817$ or in their negative emotional reaction to the first clip (control condition: $M = 3.04$, SE = 0.25; expected success condition:

[4]None of our hypothesised effects were qualified by gender.

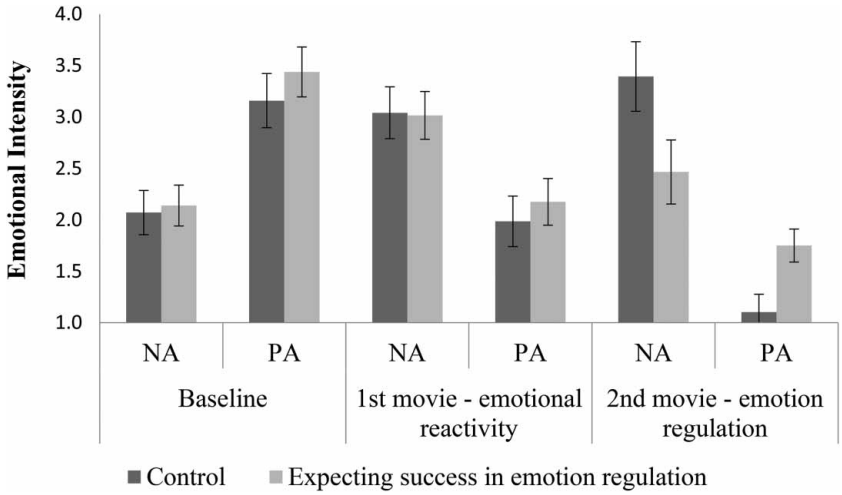

Figure 1. Intensity of negative affect (NA) and positive affect (PA) at baseline, following the first film clip and following the second film clip (when participants were instructed to regulate their emotions), as a function of condition. Errors bars reflect +/−1 standard errors.

$M = 3.02$, SE = 0.23), $d = 0.03$, $p = .941$. Nor did participants in the two conditions differ from each other in positive emotions (averaged across all positive items) at baseline (control condition: $M = 3.16$, SE = 0.26; expected success condition: $M = 3.44$, SE = 0.24), $d = -0.28$, $p = .442$, or in their positive emotional reaction to the first clip (control condition: $M = 1.99$, SE = 0.24; expected success condition: $M = 2.18$, SE = 0.23), $d = -0.19$, $p = .574$. However, as predicted, in response to the second clip, participants in the expected success condition experienced less negative emotions ($M = 2.47$, SE = 0.31) than participants in the control group ($M = 3.40$, SE = 0.39), $d = -0.93$, $p = .051$, and more positive emotions ($M = 1.75$. SE = 0.16) compared to participants in the control condition ($M = 1.10$, SE = 0.17), $d = 0.65$, $p = .010$.

This interaction qualified a main effect for time, $F(2, 70) = 12.17$, $p < .001$, partial $\eta^2 = .26$. No other effects were significant, Fs < 3.87.

Since participants in the control condition reported more intense negative emotions in response to the second clip compared to the first, we tested whether the second clip may have induced more intense emotions than the first when presented in that order. To do so, 50 participants[5] (64% male, M_{Age} = 34.38, SD = 10.64; recruited using Amazon's Mechanical Turk platform) completed the same procedure that was completed by participants in the control condition, only they were not given any information about the drug, did not take the drug and were not asked to regulate their emotions in response to the second clip. Additionally, they were not asked to rate their effort in regulating emotions or their perceived success in doing so. Similar to what we found among participants in the control condition, participants in this condition experienced more intense negative emotions after watching the second clip ($M = 3.40$, SE = 0.20) than after watching the first clip ($M = 2.73$, SE = 0.16), $d = 0.68$, $p < .001$. The difference in positive emotions between the first clip ($M = 1.56$, SE = 0.12) and the second clip ($M = 1.35$, SE = 0.16) was not significant, $d = -0.21$, $p = .144$). These findings confirm that emotional reactions to the two clips are not identical, either because they differ in their emotional impact or due to possible order-related carry-over effects. Therefore, comparisons between emotional reactions to the first and second clips within conditions likely reflect differences in the emotional impact of the clips. In contrast, comparisons across conditions cannot be attributed to differences between the clips, as these were consistent across conditions.

Discussion

This investigation provides evidence for the causal effects of expected success in emotion regulation on

[5]To ensure that participants on Mturk pay careful attention to the instructions, we added an attention check to this survey (Oppenheimer, Meyvis, & Davidenko, 2009). Specifically, approximately half way through the survey, participants were asked to mark a specific response option. Five participants failed this attention check and were excluded from the analysis.

actual success in emotion regulation. We found that leading people to temporarily expect emotion regulation to be more successful led them to more effectively regulate their emotional reactions to a negative stimulus (i.e., they experienced relatively more positive emotions and less negative emotions).

These results point to one mechanism that might underlie correlational evidence of links between beliefs about the likelihood of success in emotion regulation and adaptive emotional experiences (e.g., Catanzaro & Mearns, 1990; Tamir et al., 2007). Prior evidence has shown that expected success in emotion regulation is correlated with more positive and less negative emotional experiences, in general. Our findings demonstrate that expected success in emotion regulation actively leads to more positive and less negative emotional reactions.

These findings provide important support to the idea that emotion regulation can be influenced by social-cognitive factors, such as beliefs and expectancies (e.g., Tamir, Bigman, Rhodes, Salerno, & Schreier, 2015; Tamir & Mauss, 2011). Since emotion regulation is an important contributor to well-being and psychological health, these results may carry important pragmatic implications. They point to the potential benefit of interventions that enhance expectations of success in emotion regulation to promote positive emotional outcomes.

In the study, participants were first informed about the side effects of the drug, and the drug itself was administered later in the study. This allowed us to rule out two alternative explanations of our findings. First, people in the expected success condition may have felt better because they had just learned that they have better chances of controlling their emotions. Because our manipulation did not influence emotional experiences as measured immediately after they learned about the side effects of the pill, this account cannot explain our findings. Second, people in the expected success condition may have felt better because they were less influenced by the emotional stimuli. Because our manipulation did not influence emotional reactions to the first clip, this account cannot explain our findings. Instead, our manipulation seemed to have influenced emotional experiences when people actively tried to control their emotions. Additionally, participants did not differ in their reported attempts to regulate their emotions when watching the clips. This suggests that although participants in both the experimental and the control conditions tried to regulate their emotions, those in the experimental condition were more effective in doing so. Because these reports were based on self-reports, however, we cannot rule out the possibility that participants in the control condition did not actually try to regulate their emotions to the second clip, and therefore were less successful.

Our conclusions were based on data collected on diverse samples, using diverse procedures. Clips were selected based on a pre-test conducted on undergraduate students who watched multiple clips in random order. Our study was conducted on undergraduate students who watched two clips in a fixed order. To examine order effects, we collected additional data from a heterogenous sample on Mturk, which often differs from typical undergraduate samples (e.g., Paolacci & Chandler, 2014). Comparisons within samples are appropriate, and therefore we based our conclusions on such comparisons. We caution against comparisons across samples, because they fail to take into account the potential variation in sample characteristics and study features.

Our design makes it unlikely that effects were due to demand characteristics. Our manipulation was implicit and participants in both conditions were asked to regulate their emotions. In future studies, it may be useful to assess the degree to which participants attempt to regulate, the experience and the regulation of emotions, using measures other than self-report. Future studies should also counterbalance the order of the stimuli used, so that any differences between the time points and the conditions could not be attributed to differences between clips. Finally, to establish the generalisability of our effects, it would be useful to examine the effects of both increasing and decreasing expected success in emotion regulation, in response to negative and positive stimuli.

Future research could also examine the mechanism by which beliefs about the likelihood of success in emotion regulation influence emotion regulation. For example, people with higher self-efficacy exert more effort in self-regulation (Bandura, 1977). Similarly, to the extent that beliefs about the likelihood of success also involve changes in emotion regulation self-efficacy, people who expect to be successful in emotion regulation may try harder to control their emotional reactions, which should increase the objective likelihood of success. This and other possible

mediators could be examined in future research. By showing that expected success in emotion regulation can change how people regulate their emotions and how they feel, as a consequence, our study joins and extends research on beliefs about the likelihood of success and establishes their role in shaping emotional experiences.

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No potential conflict of interest was reported by the authors.

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