

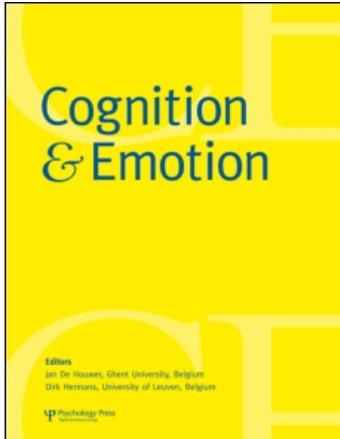
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The unconscious pursuit of emotion regulation: Implications for psychological health

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Because of the central involvement of emotion regulation in psychological health and the role that implicit (largely unconscious) processes appear to play in emotion regulation, implicit emotion-regulatory processes should play a vital role in psychological health. We hypothesised that implicitly valuing emotion regulation translates into better psychological health in individuals who use adaptive emotion-regulation strategies. A community sample of 222 individuals (56% women) who had recently experienced a stressful life event completed an implicit measure of emotion regulation valuing (ER-IAT) and reported on their habitual use of an important adaptive emotion-regulation strategy: cognitive reappraisal. We measured three domains of psychological health: well-being, depressive symptoms, and social adjustment. As hypothesised, individuals who implicitly valued emotion regulation exhibited greater levels of psychological health, but only when they were high in cognitive reappraisal use. These findings suggest that salutary effects of unconscious emotion-regulation processes depend on its interplay with conscious emotion-regulation processes.

Keywords: Implicit valuing of emotion regulation; Cognitive reappraisal; Psychological health; Unconscious goal pursuit.

Emotion regulation has wide-ranging implications for everyday functioning and psychological health (e.g., Bonanno, 2004; Gross & Muñoz, 1995; Moore, Zoellner, & Mollenholdt, 2008). Whereas adaptive emotion regulation can have positive effects, ranging from attenuated negative emotions, resilience to stressful life events, and personal growth (e.g., Bonanno, 2004), maladaptive emotion regulation appears to be a critical component in the development and maintenance of psychological disorders such as depression (e.g., Gross & Muñoz, 1995; Moore et al., 2008).

Therefore, elucidating when and why emotion regulation is adaptive versus maladaptive is crucial for the understanding of psychological health (e.g., Garnefski, Kraaij, & Spinhoven, 2001).

Recent theorising has suggested that implicit (largely unconscious) emotion-regulation processes are just as pervasive as conscious emotion-regulation processes and that they may play a key role in determining the adaptiveness of emotion regulation (e.g., Bargh & Williams, 2007; Fiori, 2009; Mauss, Bunge, & Gross, 2007). Thus, implicit emotion-regulatory processes have potentially

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crucial implications for psychological health. However, research has mainly focused on conscious emotion regulation (cf. Koole, 2009). The present study examined psychological-health correlates of a particularly important unconscious aspect of emotion regulation: the implicit value that individuals place on emotion regulation.

Implicit valuing of emotion regulation

Recent findings have established that implicit (largely unconscious) processes are strongly involved in emotion regulation (e.g., Fiori, 2009; Koole, 2009; Mauss, Bunge, et al., 2007; Phillips, Ladouceur, & Drevets, 2008). Generally, unconscious processes are defined as processes that operate independently of conscious control and outside of subjective awareness (e.g., Bargh & Williams, 2007). More specifically, unconscious processes in emotion regulation describe “goal-driven changes to any aspect of one’s emotions without making a conscious decision to do so, without paying attention to the process of regulating one’s emotions, and without engaging in deliberate control” (Mauss, Bunge, et al., 2007, p. 148).

Several unconscious emotion-regulation processes have been identified, including automatically executed emotion-regulatory behaviours, implicit models of emotions, and unconscious value placed on various emotion-regulation strategies (e.g., Etkin, Prater, Hoehn, Menon, & Schatzberg, 2010; Haas, Omura, Constable, & Canli, 2007; Koole & Jostmann, 2004; Mauss, Cook, & Gross, 2007; Mauss, Evers, Wilhelm, & Gross, 2006; Quirin, Bode, & Kuhl, 2011 this issue; Rothermund, Voss, & Wentura, 2008; Tamir, Chiu, & Gross, 2007; Tamir, John, Srivastava, & Gross, 2007; Williams, Bargh, Nocera, & Gray, 2009). Despite this variety of unconscious emotion-regulation processes, theoretical considerations suggest that one common pathway may underlie many of them: unconscious goal pursuit, or, implicitly represented values regarding emotion regulation (e.g., Bargh & Williams, 2007; Mauss, Bunge, et al., 2007; Tamir, Chiu, et al., 2007).

At the broadest level, people might implicitly value (positively regard) versus devalue (negatively

regard) emotion regulation (cf. Bargh & Williams, 2007; Mauss et al., 2006). That is, individuals may vary in the degree to which they implicitly represent emotion regulation as a desirable goal. Implicitly valuing emotion regulation is expected to be associated with enhanced engagement in emotion regulation, because when the concept of emotion regulation is activated, a signal is provided that emotion regulation is desired (Custers & Aarts, 2005). This suggests that implicit valuing of emotion regulation should unconsciously and pervasively affect individuals’ engagement in emotion regulation. Given the strong connection between emotion regulation and psychological health (e.g., Gross & Muñoz, 1995), implicit valuing of emotion regulation may thereby have important implications for psychological health.

Implicit valuing of emotion regulation and psychological health

However, there are possible hurdles when it comes to *carrying out* implicit emotion-regulation goals. Several major domains of social psychological research such as attitudes and persuasion, self-regulation, and stereotyping and prejudice, have shown that the execution of goals depends not only on individuals’ motivation but also on their ability to do so (cf. Bargh & Williams, 2007; Mischel & Ayduk, 2004). More specifically, goals may affect actual behaviour through two main processes: First, implicit processes energise spontaneous impulses to act. Second, explicit mechanisms affect deliberate engagement in particular behaviours (cf. Brunstein & Maier, 2005). Thus, motivation to engage in emotion regulation *per se* may not be sufficient to predict adaptive outcomes. Rather, one may additionally have to consider an individual’s engagement in adaptive types of emotion regulation. Building on these assumptions, we hypothesised an interaction model for the relationship between implicit valuing of emotion regulation and psychological health. We posited that individuals who implicitly value emotion regulation are generally more motivated to engage in emotion regulation. However, the impact of implicitly valuing emotion

regulation on psychological health was expected to vary based on the adaptiveness of the specific emotion-regulation strategies in which people habitually engage.

Research on deliberate emotion regulation has shown that different types of emotion regulation are adaptive to different degrees (e.g., Gross & John, 2003; see Koole, 2009, for a recent review). One particularly adaptive type of emotion regulation is reappraisal, which refers to changing how individuals appraise the situation they are in to alter its emotional significance (e.g., Gross & John, 2003). For example, individuals can regard a negative emotional event like sudden unemployment as a challenge that could be overcome and as a chance to expect something new to come. Individuals who engage in reappraisal tend to feel a higher sense of purpose in life, feel less depressed, and have strengthened social bonds, relative to individuals who engage in other, less adaptive, emotion-regulation strategies (e.g., Gross & John, 2003). In sum, we predicted that implicit valuing of emotion regulation may only have positive psychological health outcomes in individuals who habitually use adaptive emotion-regulation strategies, reappraisal most prominently among them. In individuals who do not make use of this adaptive type of emotion regulation, implicitly valuing emotion regulation should have no positive effects on psychological health.

There is some empirical evidence consistent with this idea. Mauss et al. (2006) used a variant of the Implicit Association Test (cf. Greenwald, McGhee, & Schwartz, 1998) to measure implicit positive versus negative associations with the concept of emotion regulation (emotion regulation IAT; ER-IAT), thereby measuring implicit valuing of emotion regulation. Consistent with the notion that implicit valuing of emotion regulation can trigger engagement in emotion regulation, the ER-IAT predicted decreased subjective, behavioural, and maladaptive physiological responses to a laboratory anger provocation. However, Mauss et al. (2006) found no significant direct relationships between implicit valuing of emotion regulation and psychological health indicators (e.g., depressive symptoms). As argued

above, we suppose that this is because implicit valuing of emotion regulation should have positive health outcomes only in combination with adaptive types of emotion regulation.

The present research

The present study aimed to investigate the interplay of implicit valuing of emotion regulation with individuals' habitual use of adaptive emotion regulation in predicting psychological health. To enhance generalisability of our results across a range of sociodemographic groups, we recruited a community sample of men and women aged 21 to 60 (cf. Moore et al., 2008). We recruited a sample that was exposed to recent stressful life events because such a sample would enhance variance in the psychological health outcomes that we were interested in (e.g., Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Garnefski et al., 2001; Moore et al., 2008) and because assessing emotion-regulation processes in the face of stressful life events is of great applied importance (e.g., Bonanno et al., 2004; Gross & John, 2003).

We used the ER-IAT to measure implicit valuing of emotion regulation because of its established psychometric properties (cf. Mauss et al., 2006). We focused on cognitive reappraisal as an indicator of adaptive emotion regulation because research has shown that cognitive reappraisal is a particularly important adaptive form of emotion regulation (e.g., Garnefski et al., 2001; Gross & John, 2003; Moore et al., 2008; Tamir, John, et al., 2007). To capture a wide range of facets of psychological health, like others (e.g., Gross & Muñoz, 1995; Tamir, John, et al., 2007) we measured well-being, depressive symptoms, and social adjustment.

We predicted that in individuals who were high in the habitual use of cognitive reappraisal, implicit valuing of emotion regulation would be positively associated with well-being, negatively associated with depressive symptoms, and positively associated with social adjustment. We did not predict an association of implicit valuing of emotion regulation with psychological health in

individuals who were low in the habitual use of cognitive reappraisal.

METHOD

Sample

Participants were 222 individuals (56% women, 44% men) from the Denver Metro Area. Participants were recruited through postings in online bulletins or in public areas such as Laundromats and local hospitals. Their average age was 39.5 years ($SD = 11.6$, Range: 21–60). The ethnic composition was mixed: 82% were European American, 2% were Asian American, 5% were African American, 9% were either mixed race or other, and 2% of the sample chose not to identify their ethnicity. Participants also reported a wide range of family income levels: 6% reported earning less than \$10,000 per year, 7% between \$10,000 and \$20,000, 8% between \$20,000 and \$30,000, 11% between \$30,000 and \$40,000, 11% between \$40,000 and \$50,000, 14% between \$50,000 and \$70,000, 18% between \$70,000 and \$100,000, 10% above \$100,000, and 15% did not report their income.

Participants were selected during initial telephone interviews as having experienced at least one stressful life event (SLE) in the past three months. A SLE was defined to participants during recruitment as an event with a distinct starting point (i.e., a relatively acute instead of a chronic stressor) that had a significant, negative impact on participants' lives. The most common SLEs in the sample were: Major change in financial status (67%), changed work situation (59%), and trouble with employer (41%).

Procedure

Participants filled out questionnaires online at home within one week after the initial telephone interview. Questionnaires assessed demographics, perceived negative impact of recent SLEs, explicit valuing of emotion regulation, habitual use of cognitive reappraisal, and psychological health (see measures section). Other self-report measures

were also collected but are not reported here because they were not relevant to the present results. Within four weeks after completing the questionnaires, participants were invited to individual laboratory sessions at the University of Denver to complete the ER-IAT (see measures section). Upon arrival at the lab, the procedures were explained to the participants. To maximise privacy during data collection, participants were left alone in the experiment room. To maximise comfort and to ensure the same laboratory environment for each participant, the room was quiet and windowless, and low levels of incandescent light were used.

Measures

Negative impact of stressful life events. To measure the cumulative negative impact of stressful life events (SLEs) that each participant had experienced in the past 18 months as a control variable, we used the Life Experiences Survey (LES; Sarason, Johnson, & Siegel, 1978). The LES consists of 46 items assessing a wide range of stressors, both positive (e.g., marriage) and negative (e.g., death of a spouse). For each item, participants indicated if a particular event had occurred within the last 18 months, and its subjective impact with ratings on a 7-point scale, ranging from $-3 = \text{"extremely negative"}$, to $0 = \text{"no impact"}$ and $+3 = \text{"extremely positive"}$. Subjectively perceived impact of SLEs was assessed rather than more objective aspects (e.g., sheer number of SLEs) because stress is, in essence, a subjective phenomenon (Lazarus, DeLongis, Folkman, & Gruen, 1985). Furthermore, although recruitment criteria specified that each participant should have experienced a SLE in the past three months, this was likely not the only SLE that participants had faced. We measured the impact of events as far back as 18 months because previous research has shown that SLEs can have long-lasting, negative impacts on people's lives (Lorenz, Wickrama, Conger, & Elder, 2006; Morales & Guerra, 2006). We focused on the negative impact of stressors because previous research has shown that negative events are better predictors of

psychological health outcomes (Sarason, Sarason, Potter, & Antoni, 1985; Vinokur & Selzer, 1975). Thus, a total cumulative negative impact score was calculated by summing all impact ratings of negatively rated SLEs. Summed scores were then reverse coded, so that a higher score denotes more subjective negative impact of cumulative stressful life events. We refer to this variable as "SLE-impact". The present sample included individuals who had experienced a wide range of cumulative stress (SLE-impact: $M = 14.36$, $SD = 9.91$, Range: 2–44).

Explicit valuing of emotion regulation. We also assessed participants' explicit valuing of emotion regulation as a control variable by using a 6-item-scale, ranging from 1 = "strongly disagree" to 7 = "strongly agree", developed by Mauss et al. (2006). Items of this scale ask people how much they regard emotion control as valuable (e.g., "People in general should control their emotions more"; $\alpha = .67$).

Habitual use of cognitive reappraisal. Habitual use of cognitive reappraisal was assessed with the 6-item reappraisal subscale of the Emotion Regulation Questionnaire (ERQ). The ERQ is a widely used 10-item self-report questionnaire (Gross & John, 2003). A sample item for cognitive reappraisal is: "When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm". Answers are given on a 7-point Likert scale, ranging from 1 = "strongly disagree" to 7 = "strongly agree" ($\alpha = .85$).

Implicit valuing of emotion regulation. Implicit valuing of emotion regulation was assessed using the Emotion Regulation-IAT (ER-IAT; see Mauss et al., 2006), administered on a PC. Items from the categories emotion regulation, emotion expression, positive, and negative were presented. Participants were told that they should respond as rapidly as possible in categorising each stimulus word but not so fast as to make many errors. The ER-IAT comprised five blocks. Blocks 1, 2, and 4 consisted of practice trials (20 each). In the critical Block 3, participants categorised items into two combined categories, namely, emotion regulation

and positive items versus emotion expression and negative items (20 practice and 40 critical trials). In the second critical Block 5, participants again categorised items into two combined categories with switched key assignments, emotion expression and positive items versus emotion regulation and negative items (20 practice and 40 critical trials). If participants gave an incorrect answer at first, the program waited for the correct answer, leading to a built-in error penalty. IAT reaction-time data were scored following Greenwald, Nosek, and Banaji (2003) using the algorithm that showed the greatest validity, stability, and resistance against artefacts ("D"). Data from practice as well as test trials were used. To adjust for variability of latencies, SD s across practice and test trials were computed for each respondent. Average latencies of practice and test trials were divided by the resulting SD s. Final IAT scores were calculated by subtracting averages from Block 3 from averages from Block 5. Higher ER-IAT scores thus indicate more implicit valuing of emotion regulation relative to emotion expression. To compute internal consistency, we subtracted each Block 3 trial's response latency from the corresponding Block 5 trial's response latency ($\alpha = .84$).

Psychological health. Psychological health was indexed by measuring well-being, depressive symptoms, and social adjustment. Although these indices of psychological health are generally moderately correlated with each other (see Table 1 for the present data), they are conceptually distinct and can in principle show divergent effects (e.g., Gross & John, 2003; Ryff et al., 2006). We thus considered them separately.

To measure participants' psychological well-being, participants filled out the widely used 18-item well-being scale (ranging from 1 = "strongly disagree" to 7 = "strongly agree"; $\alpha = .85$) developed by Ryff and Keyes (1995). Depressive symptoms were measured using the Beck Depression Inventory (BDI; Beck & Steer, 1984), a self-report measure consisting of 21 items ($\alpha = .92$). One question which pertains to suicidal thoughts was not included due to IRB

Table 1. Means, standard deviations, and intercorrelations of study variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. <i>Sex</i> ^a	1.56	0.50	—						
2. <i>SLE-impact</i>	14.36	9.91	.08	—					
3. <i>Expl.-ER</i>	3.21	0.95	-.17*	-.06	—				
4. <i>ER-IAT</i>	-0.08	0.45	-.08	.05	.16*	—			
5. <i>Trait-Reappraisal</i>	5.04	1.09	.12	.03	-.02	.17*	—		
6. <i>Well-Being</i>	4.40	0.74	.08	-.36**	-.02	.04	.28**	—	
7. <i>Depressive Symptoms</i>	5.55	7.22	.07	.44**	.06	.02	-.07	-.52**	—
8. <i>Social Adjustment</i>	3.20	0.65	.06	-.30**	-.04	.10	.23**	.60**	-.48**

Notes: *N* = 222. **Significant at $\alpha < .01$ (two-tailed); *significant at $\alpha < .05$ (two-tailed). ^a1 = male, 2 = female. SLE-impact = Perceived Negative Impact of Stressful Life Events; ER-IAT = Emotion Regulation Implicit Association Test; Expl.-ER = Explicit Evaluation of Emotion Regulation.

concerns. Finally, to obtain an index of social adjustment, participants were asked to answer the 12 items (ranging from 1 = “definitely false” to 4 = “definitely true”) of the Interpersonal Support Evaluation List (ISEL; Cohen, Mermelstein, Kamarck, & Hoberman, 1985; $\alpha = .90$).

Data analysis

To test our hypotheses that implicit valuing of emotion regulation is associated with greater well-being, fewer depressive symptoms, and better social adjustment in individuals high but not low in reappraisal, we conducted hierarchical regression analyses. We began by centring the predictor, moderator and control variables, and then multiplied the centred variables for reappraisal and implicit valuing of emotion regulation to create a continuous interaction term. In the first step of the regression, we entered our predictor implicit positive valuing of emotion regulation, our moderator reappraisal, as well as our control variables sex, SLE-impact, and explicit valuing of emotion regulation. We statistically controlled for these variables because they constitute important potential confounds in the relationship between emotion regulation and psychological health (e.g., Garnefski et al., 2001; Gross & John, 2003). We did not expect perceived impact of stressful life events to moderate the hypothesised relationships between implicit valuing of emotion regulation, reappraisal, and psychological health. Consistent with other research (e.g., Garnefski

et al., 2001; Gross & John, 2003), we assumed that effective emotion regulation is beneficial to psychological health across different stress levels. Supplemental analyses of our data revealed no three-way-interactions between implicit valuing of emotion regulation, and habitual use of cognitive reappraisal with sex, SLE-impact, or explicit valuing of emotion regulation, respectively, in predicting well-being, depressive symptoms, and social adjustment (all *ps* > .12).

In the second step, we entered the interaction term of implicit valuing of emotion regulation and reappraisal. If the interaction reached statistical significance, we conducted post hoc simple slope tests among individuals ± 1 standard deviation from the mean of the habitual use of reappraisal. According to our directional hypothesis that implicitly valuing emotion regulation is associated with better psychological health (more well-being, fewer depressive symptoms, more social adjustment) in participants scoring high in reappraisal, respective post hoc tests for significance were one-tailed.

RESULTS

Means, standard deviations, and intercorrelations of study variables are displayed in Table 1.

Regression analyses indicated that implicit valuing of emotion regulation had no significant main effect on well-being, $b = 0.01$, $p = .77$, depressive symptoms, $b = 0.06$, $p = .90$, and social

Table 2. Summary of hierarchical regression analyses for variables predicting well-being, depressive symptoms, and social adjustment

Variable	Well-being				Depressive symptoms				Social adjustment			
	Step 1		Step 2		Step 1		Step 2		Step 1		Step 2	
	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>
Sex	0.05	1.13	0.06	1.26	0.47	1.04	0.42	0.93	0.03	0.79	0.04	0.92
SLE-impact	-0.29	-6.14**	-0.30	-6.38**	3.32	7.25**	3.40	7.49**	-0.22	-5.12**	-0.23	-5.33**
Expl.-ER	-0.02	-0.47	-0.04	-0.75	0.70	1.51	0.83	1.79	-0.04	-0.96	-0.05	-1.22
IAT-ER	0.01	0.29	0.03	0.65	0.06	0.12	-0.11	-0.23	0.06	1.47	0.08	1.80
Trait-Reappraisal	0.21	4.50**	0.22	4.69**	-0.65	-1.43	-0.71	-1.58	0.14	3.33**	0.15	3.49**
IAT-ER × Trait-Reappraisal			0.11	2.40*			-1.09	-2.35*			0.10	2.23*
	$R^2 = .22$		$R^2 = .24$ ($\Delta R^2 = .02^*$)		$R^2 = .21$		$R^2 = .23$ ($\Delta R^2 = .02^*$)		$R^2 = .16$		$R^2 = .18$ ($\Delta R^2 = .02^*$)	

Notes: $N = 222$. ** $p < .01$; * $p < .05$. SLE-impact = Perceived Negative Impact of Stressful Life Events; ER-IAT = Emotion Regulation Implicit Association Test; Expl.-ER = Explicit Evaluation of Emotion Regulation.

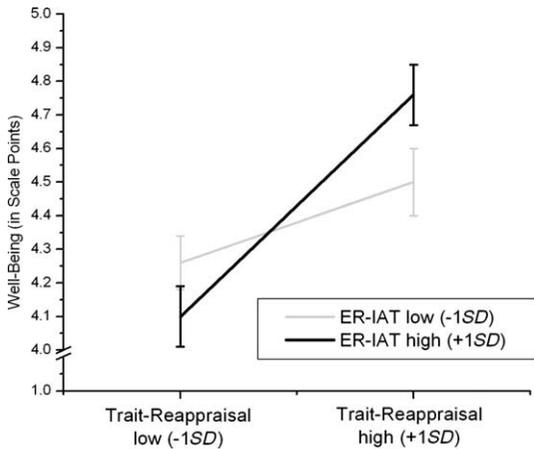


Figure 1. Interaction of implicit valuing of emotion regulation (ER-IAT) and trait reappraisal for well-being (possible scores from 1 to 7). Regression lines are drawn at ± 1 standard deviation from the means of implicit valuing of emotion regulation and trait-reappraisal. Error bars represent standard errors from the mean of ± 1 standard deviation of trait-reappraisal.

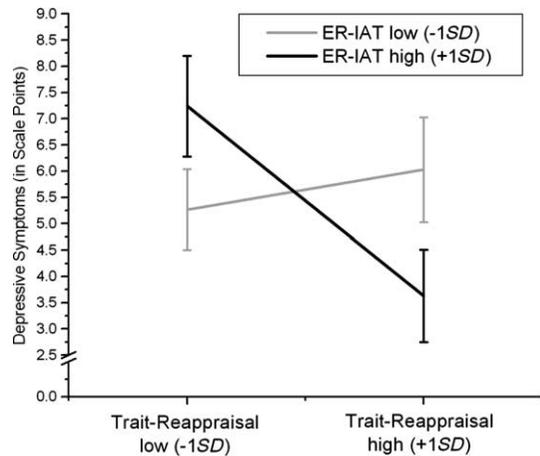


Figure 2. Interaction of implicit valuing of emotion regulation (ER-IAT) and trait reappraisal for depressive symptoms (possible scores from 0 to 60). Regression lines are drawn at ± 1 standard deviation from the means of implicit valuing of emotion regulation and trait-reappraisal. Error bars represent standard errors from the mean of ± 1 standard deviation of trait-reappraisal.

adjustment, $b = 0.06$, $p = .14$. Reappraisal was significantly related to higher well-being, $b = 0.21$, $p < .01$, but not to depressive symptoms, $b = -0.65$, $p = .16$. Furthermore, reappraisal was significantly associated with greater social adjustment, $b = 0.14$, $p < .01$ (Table 2).

To test our hypotheses we examined interactions between implicit valuing of emotion regulation and reappraisal. Hypotheses were supported with significant interactions of implicit valuing of emotion regulation and reappraisal on well-being, $b = 0.11$, $p < .05$, depressive symptoms, $b = -1.09$, $p < .05$, and social adjustment, $b = 0.10$, $p < .05$.

As expected, simple slope analyses revealed that implicit valuing of emotion regulation was related to greater well-being for individuals high in reappraisal, $b = 0.14$, $p < .05$, but not low in reappraisal, $b = -0.08$, $p = .18$ (Figure 1). Regarding depressive symptoms, simple slope analyses demonstrated that implicit valuing of emotion regulation was related to less depressive symptoms for participants high in reappraisal, $b = -1.20$, $p < .05$, but not for participants low in reappraisal, $b = 0.99$, $p = .10$ (Figure 2). Furthermore, implicit valuing of emotion regula-

tion was associated with greater social adjustment for participants high in reappraisal, $b = 0.17$, $p < .01$, but not for those scoring low in reappraisal, $b = -0.02$, $p = .73$ (Figure 3).

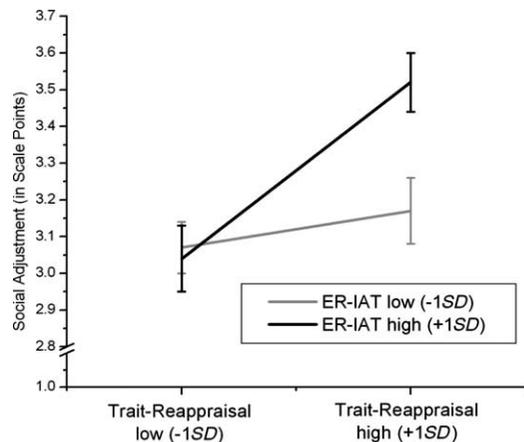


Figure 3. Interaction of implicit valuing of emotion regulation (ER-IAT) and trait reappraisal for social adjustment (possible scores from 1 to 4). Regression lines are drawn at ± 1 standard deviation from the means of implicit valuing of emotion regulation and trait-reappraisal. Error bars represent standard errors from the mean of ± 1 standard deviation of trait-reappraisal.

Performing post hoc tests when conditioning on implicit valuing of emotion regulation yielded similar results. Reappraisal was associated with greater well-being in individuals high in implicit valuing of emotion regulation, $b = 0.29$, $p < .01$, but not for those low in implicit valuing of emotion regulation, $b = 0.09$, $p = .11$ (see Figure 1). Furthermore, reappraisal was only related to fewer depressive symptoms for individuals scoring high in implicit valuing of emotion regulation, $b = -1.80$, $p < .01$, but not in individuals low in implicit valuing of emotion regulation, $b = 0.38$, $p = .82$ (see Figure 2). Moreover, reappraisal was only associated with better social adjustment in individuals high in implicit valuing of emotion regulation, $b = 0.24$, $p < .01$, but not for those low in implicit valuing of emotion regulation, $b = 0.05$, $p = .39$ (see Figure 3).

DISCUSSION

Although previous findings indicate that unconscious processes are implicated in emotion regulation, little research has examined their relationships with psychological health. The present study examined the psychological-health correlates of one particularly important and pervasive unconscious process in emotion regulation: the degree to which individuals implicitly value emotion regulation, which presumably motivates people to use emotion regulation (Mauss et al., 2006). Because different types of emotion regulation are adaptive to different degrees, merely being implicitly motivated to engage in emotion regulation may not be sufficient to improve psychological health. We therefore expected implicit valuing of emotion regulation to be related to better psychological health only in individuals who habitually use adaptive emotion-regulation strategies such as cognitive reappraisal.

In line with this hypothesis, the present findings document that in a sample recently faced with stressful life events, implicit valuing of emotion regulation was associated with better psychological health (indexed by well-being, depressive symptoms, and social adjustment), but only among

participants who habitually use cognitive reappraisal. In participants who do not habitually make use of reappraisal, no relationship between implicit valuing of emotion regulation and psychological health was found. These relationships held when controlling for explicitly valuing emotion regulation. These findings indicate that implicitly valuing emotion regulation can promote psychological health as long as people use adaptive emotion-regulation strategies.

At first glance, the present findings may appear to contradict laboratory findings by Mauss et al. (2006), who found a main effect of implicitly valuing emotion regulation on reduced negative affective responding to an anger provocation. This may seem inconsistent with the present findings, which suggest that implicit valuing of emotion regulation affects psychological health only in interaction with adaptive forms of emotion regulation. Why would implicitly valuing emotion regulation unconditionally lead to lower negative emotional responding but to better psychological health only in individuals who engage in particular types of emotion regulation? One explanation seems plausible. It may be that unspecific implicit valuing of emotion regulation leads to greater engagement in emotion regulation and thus to dampened negative emotional responses. However, such dampened negative emotional responses per se may not be adaptive because they may involve a hidden cost. Rather, it may be that only specific ways of arriving at dampened negative emotion reactivity (e.g., those achieved via reappraisal) are adaptive in the longer term (e.g., Gross & Thompson, 2007; Koole, 2009). This assumption is supported by supplemental analyses in which we tested whether implicit valuing of emotion regulation also interacted with the habitual use of a less adaptive emotion-regulation strategy (suppression, measured by the ERQ-suppression subscale reported in Gross & John, 2003) to predict psychological health. No significant interaction was found in the present study, suggesting that implicitly valuing emotion regulation only leads to beneficial effects in conjunction with *adaptive* emotion-regulation strategies.

Our results appear to be relatively generalisable. By examining a community sample recently faced with a range of stressful life events, we are able to generalise not only to individuals of various ages, economic, and educational backgrounds but also to the context of stress in everyday life, a particularly important and pervasive challenge to psychological health (e.g., Tamir, John, et al., 2007). Results were not moderated by differences in individuals' stress level. Therefore, it is plausible that implicitly valuing emotion regulation has beneficial effects across stress levels among individuals who habitually use adaptive emotion-regulation strategies. Furthermore, effects were revealed across three health domains, including well-being, depressive symptoms, and social adjustment. Although these domains are often correlated with one another, they are conceptually distinct and can be dissociated (e.g., Ryff & Keyes, 1995; Ryff et al., 2006). It is thus not trivial that observed effects were found across these domains.

Implications for emotion regulation

The present findings have four important implications for our understanding of emotion regulation. First, our results support theorising that unconscious processes are an important part of emotion regulation (Bargh & Williams, 2007; Mauss, Bunge, et al., 2007). By documenting links with psychological-health outcomes, the present study shows that unconscious processes involved in emotion regulation are not simply a laboratory phenomenon. In fact, unconscious emotion-regulatory processes could be especially important for everyday life, where time and attentional constraints may often preclude voluntary and conscious emotion regulation (e.g., Fiori, 2009; Tamir, John, et al., 2007). Thus, we corroborate the idea that emotion regulation is crucially governed by unconscious processes.

Second, our results contribute to the literature on emotion regulation by highlighting the importance of emotion-regulation goals (Tamir, 2009). Values that individuals place on emotion regulation arguably map onto the goals they will

pursue, such that individuals who positively value emotion regulation are expected to generally be motivated to regulate their emotions. Up to now, very little research has examined goals in the realm of emotion regulation, and even less research has examined implicit emotion-regulation goals (cf. Tamir & Mauss, in press). The present results thus make an important contribution to exploring a core process that explains why individuals engage in emotion regulation: their regulatory goals.

Third, we demonstrated that the unconscious processes associated with implicit valuing of emotion regulation are—in conjunction with cognitive reappraisal—highly adaptive. This is consistent with laboratory studies that have documented adaptive correlates of unconscious aspects of emotion regulation (e.g., Mauss, Cook, et al., 2007; Mauss et al., 2006; Rothermund et al., 2008; Tamir, Chiu, et al., 2007; Williams et al., 2009). In addition, when we conducted secondary analyses in the present study, we found no significant interactions of explicit valuing of emotion regulation and reappraisal with regard to psychological health. It has been hypothesised that adaptive effects specifically of implicit values regarding emotion regulation are due to the fact that the implicit initiation of emotion regulation is not subject to the same memory and attention limitations as deliberate initiation, and thus is associated with little effort (e.g., Bargh & Williams, 2007; Mauss, Bunge, et al., 2007; Webb & Sheeran, 2008). Our results provide evidence consistent with this hypothesis.

Fourth, we contribute to research on the interplay of implicit and explicit emotion-regulation processes. Our findings show that implicit emotion-regulation processes are associated with psychological health outcomes only among individuals who habitually use an adaptive, relatively conscious emotion-regulation strategy (cognitive reappraisal). Describing the interaction differently, one could also say that the habitual use of cognitive reappraisal is most beneficial when it is supported by highly implicitly valuing emotion regulation. In either framing, our results suggest that convergence of nonconsciously operating

emotion-regulation goals with adaptive conscious self-regulatory activities predicts the best outcomes (see Williams et al., 2009). These findings dovetail with research demonstrating that a match between implicit and explicit aspects in goal achievement is associated with adaptive outcomes (see Baumann, Kaschel, & Kuhl, 2005; Brunstein & Maier, 2005). Additionally, the present results are in line with contemporary dual-process models, which assume that behaviour usually depends on the interplay of unconscious and conscious processes (e.g., Fiori, 2009; Gawronski & Bodenhausen, 2005). Thus, our results provide further evidence for dual-process models by suggesting that concurrently accounting for unconscious and conscious aspects of emotion regulation provides the best insights into emotion regulation and its implications. Beyond that, we established a specific model of how this interplay of implicit and explicit emotion-regulation processes might be related to better psychological health: conscious emotion regulation habits may enable unconscious emotion-regulation goals to exert salutary effects.

Implications for psychological health and interventions

Our findings contribute to a better understanding of how emotion regulation is involved in psychological health. Numerous studies have established that emotion regulation is of crucial importance for psychological health (e.g., Garnefski et al., 2001; Gross & Muñoz, 1995; Moore et al., 2008). Our results extend these studies in demonstrating that differences in psychological health can be predicted by the interplay of individual differences in implicit valuing of emotion regulation and habitual use of adaptive emotion regulation. Emotion-regulation deficits may stem from both implicit representations of emotion regulation and lack of available adaptive emotion-regulation strategies. This is consistent with the notion that many of the challenges to adaptive emotion regulation are rooted in unconscious processes in addition to conscious processes (e.g., Etkin et al., 2010).

The present findings have implications for interventions as well. More specifically, they

suggest that interventions may be beneficial that enhance positive implicit valuing of emotion regulation. At first blush, implicit valuing of emotion regulation seems to be hardly malleable because it is outside of awareness. However, research on implicit associations has shown that implicit representations can be changed (e.g., Lowery, Hardin, & Sinclair, 2001). This is because implicit associations—just like explicit associations—are suggested to have developed as a result of repeated learning of contingencies (Strack & Deutsch, 2004). According to Bargh and Williams (2007) one important contingency is success of emotion regulation, which should be important in the development of associations between emotion regulation and positive concepts (cf. Custers & Aarts, 2005). Thus, training procedures that allow individuals to experience emotion regulation as successful may positively influence the implicit value people place on emotion regulation. Conversely, these results suggest that the most successful interventions might be those that change implicit aspects of emotion regulation in addition to conscious ones.

In addition, the present results add to research suggesting that training procedures that specifically enhance cognitive reappraisal would be promising (e.g., Gross & Thompson, 2007; Williams et al., 2009). Research suggests that cognitive reappraisal ability plays an important and distinct role in successful psychotherapy (Carrico, Antoni, Weaver, Lechner, & Schneiderman, 2005). Our results are consistent with such findings by showing that reappraisal use has positive effects on psychological health.

Limitations and future directions

Although the present research offers intriguing insights into how emotion regulation is related to psychological health, this study is not without limitations. First, the current design is cross-sectional. The present research focused on interaction effects between implicit valuing and reappraisal on psychological health, which makes reverse effects less plausible because it is difficult to explain why, for instance, psychological health

should affect reappraisal use in interaction with implicit valuing of emotion regulation. Nonetheless, we cannot confidently draw causal inferences from the present design. Thus, longitudinal and experimental designs that account for direction of effects are indicated.

Second, we relied mainly on self-report measures. Self-report measures featured prominently in our study because we were interested in perceptual constructs such as well-being and depressive mood, which can be reliably measured with self-report questionnaires (e.g., Mauss & Robinson, 2009). However, implicit valuing of emotion regulation was assessed using an indirect measure in a laboratory context, decreasing the risk of shared method variance. Nevertheless, future studies that utilise converging methods such as peer ratings of individuals' well-being, depressive symptoms, and social adjustment or more objective health indicators such as diagnostic interviews, biomarkers, or number of physician visits are needed.

Third, numerous studies led us to focus on cognitive reappraisal as a particularly important adaptive form of emotion regulation (e.g., Gross & John, 2003). Surprisingly, no significant main effect of reappraisal on depressive symptoms was revealed. In contrast with other studies (e.g., Garnefski et al., 2001; Gross & John, 2003; Moore et al., 2008), we found that reappraisal is only conditionally related to lesser depressive symptoms. Further research should deepen our understanding of the interplay of implicit valuing of emotion regulation and adaptive emotion regulation, for instance in examining other types of adaptive emotion regulation. There may be contexts in which other regulation strategies are equally or even more adaptive than reappraisal (e.g., expressive modulation; see Bonanno et al., 2004). Moreover, future research could also develop more measurements of specific implicit emotion-regulation goals (e.g., implicit valuing of reappraisal; see Williams et al., 2009).

Fourth, we regard our subclinical community sample under investigation as an important strength of the current study because it renders the present results generalisable. However, further

research is needed to explore if the observed effects generalise to clinical outcomes, such as depressive or anxiety disorders.

Concluding comment

In sum, the present study demonstrated that implicitly valuing emotion regulation is associated with better psychological health for individuals who habitually use cognitive reappraisal. Thereby, the current study suggests that the implicit goal to regulate emotions and its interplay with adaptive emotion regulation are of crucial importance for understanding emotion regulation and its implications for psychological health. Moreover, we provide evidence for the notion that adaptive emotional control depends on both nonconscious and conscious processes.

REFERENCES

- Bargh, J. A., & Williams, L. E. (2007). The nonconscious regulation of emotion. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 429–445). New York, NY: Guilford Press.
- Baumann, N., Kaschel, R., & Kuhl, J. (2005). Striving for unwanted goals: Stress-dependent discrepancies between explicit and implicit achievement motives reduce subjective well-being and increase psychosomatic symptoms. *Journal of Personality and Social Psychology, 89*, 781–799.
- Beck, A. T., & Steer, R. A. (1984). Internal consistencies of the original and revised Beck Depression Inventory. *Journal of Clinical Psychology, 40*, 1365–1367.
- Bonanno, G. A. (2004). Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? *American Psychologist, 59*, 20–28.
- Bonanno, G. A., Papa, A., Lalande, K., Westphal, M., & Coifman, K. (2004). The importance of being flexible: The ability to both enhance and suppress emotional expression predicts long-term adjustment. *Psychological Science, 15*, 482–487.
- Brunstein, J. C., & Maier, G. W. (2005). Implicit and self-attributed motives to achieve: Two separate but interacting needs. *Journal of Personality and Social Psychology, 89*, 205–222.

- Carrico, A. W., Antoni, M. H., Weaver, K. E., Lechner, S. C., & Schneiderman, N. (2005). Cognitive-behavioural stress management with HIV-positive homosexual men: Mechanisms of sustained reductions in depressive symptoms. *Chronic Illness, 1*, 207–215.
- Cohen, S., Mermelstein, R., Kamarck, T., & Hoberman, H. M. (1985). Measuring the functional components of social support. In I. G. Sarason & B. R. Sarason (Eds.), *Social support: Theory, research and applications* (pp. 73–94). Dordrecht, The Netherlands: Martinus Nijhoff.
- Custers, R. C., & Aarts, H. (2005). Positive affect as implicit motivator: On the conscious operation of behavioral goals. *Journal of Personality and Social Psychology, 89*, 129–142.
- Etkin, A., Prater, K. E., Hoefft, F., Menon, V., & Schatzberg, A. F. (2010). Failure of anterior cingulate activation and connectivity with the amygdala during implicit regulation of emotional processing in generalized anxiety disorder. *American Journal of Psychiatry, 167*, 545–554.
- Fiori, M. (2009). A new look at emotional intelligence: A dual-process framework. *Personality and Social Psychology Review, 13*, 21–44.
- Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and emotional problems. *Personality and Individual Differences, 30*, 1311–1327.
- Gawronski, B., & Bodenhausen, G. V. (2005). Accessibility effects on implicit social cognition: The role of knowledge activation and retrieval experiences. *Journal of Personality and Social Psychology, 89*, 672–685.
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology, 74*, 1464–1480.
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*, 197–216.
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion-regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*, 348–362.
- Gross, J. J., & Muñoz, R. F. (1995). Emotion regulation and mental health. *Clinical Psychology: Science and Practice, 2*, 151–164.
- Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3–24). New York, NY: Guilford Press.
- Haas, B. W., Omura, K., Constable, R. T., & Canli, T. (2007). Is automatic emotion regulation associated with agreeableness? A perspective using a social neuroscience approach. *Psychological Science, 18*, 130–132.
- Koole, S. L. (2009). The psychology of emotion regulation. *Cognition and Emotion, 23*, 4–41.
- Koole, S. L., & Jostmann, N. B. (2004). Getting a grip on your feelings: Effects of action orientation and external demands on intuitive affect regulation. *Journal of Personality and Social Psychology, 87*, 974–990.
- Lazarus, R. S., DeLongis, A., Folkman, S., & Gruen, R. (1985). Stress and adaptational outcomes: The problem of confounded measures. *American Psychologist, 40*, 770–779.
- Lorenz, F. O., Wickrama, K. A. S., Conger, R. D., & Elder, G. H., Jr. (2006). The short-term and decade-long effects of divorce on women's midlife health. *Journal of Health and Social Behavior, 47*, 111–125.
- Lowery, B. S., Hardin, C. D., & Sinclair, S. (2001). Social influence effects on automatic racial prejudice. *Journal of Personality and Social Psychology, 81*, 842–855.
- Mauss, I. B., Bunge, S. A., & Gross, J. J. (2007). Automatic emotion regulation. *Social and Personality Psychology Compass, 1*, 146–167.
- Mauss, I. B., Cook, C. L., & Gross, J. J. (2007). Automatic emotion regulation during anger provocation. *Journal of Experimental Social Psychology, 43*, 698–711.
- Mauss, I. B., Evers, C., Wilhelm, F. H., & Gross, J. J. (2006). How to bite your tongue without blowing your top: Implicit evaluation of emotion regulation predicts affective responding to anger provocation. *Personality and Social Psychology Bulletin, 32*, 589–602.
- Mauss, I. B., & Robinson, M. D. (2009). Measures of emotion: A review. *Cognition and Emotion, 23*, 209–237.
- Mischel, W., & Ayduk, O. (2004). Willpower in a cognitive-affective processing system: The dynamics of delay of gratification. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 99–129). New York, NY: Guilford Press.

- Moore, S. A., Zoellner, L. A., & Mollenholdt, N. (2008). Are expressive suppression and cognitive reappraisal associated with stress-related symptoms? *Behaviour Research and Therapy, 46*, 993–1000.
- Morales, J. R., & Guerra, N. G. (2006). Effects of multiple context and cumulative stress on urban children's adjustment in elementary school. *Child Development, 77*, 907–923.
- Phillips, M. L., Ladouceur, C. D., & Drevets, W. C. (2008). A neural model of voluntary and automatic emotion regulation: Implications for understanding the pathophysiology and neurodevelopment of bipolar disorder. *Molecular Psychiatry, 13*, 833–857.
- Quirin, M., Bode, R. C., & Kuhl, J. (2011). Recovering from negative events by boosting implicit positive affect. *Cognition and Emotion, 25*, 559–570.
- Rothermund, K., Voss, A., & Wentura, D. (2008). Counter-regulation in affective attentional bias: A basic mechanism that warrants flexibility in motivation and emotion. *Emotion, 8*, 34–46.
- Ryff, C. D., Dienberg Love, G., Urry, H. L., Muller, D., Rosenkranz, M. A., Friedman, E. M., et al. (2006). Psychological well-being and ill-being: Do they have distinct or mirrored biological correlates? *Psychotherapy and Psychosomatics, 75*, 85–95.
- Ryff, C. D., & Keyes, C. L. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology, 69*, 719–727.
- Sarason, I. G., Johnson, J. H., & Siegel, J. M. (1978). Assessing the impact of life changes: Development of the life experiences survey. *Journal of Consulting and Clinical Psychology, 46*, 932–946.
- Sarason, I. G., Sarason, B. R., Potter, E. H., & Antoni, M. H. (1985). Life events, social support, and illness. *Psychosomatic Medicine, 47*, 156–163.
- Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review, 8*, 220–247.
- Tamir, M. (2009). What do people want to feel and why? Pleasure and utility in emotion regulation. *Current Directions in Psychological Science, 18*, 101–105.
- Tamir, M., Chiu, C. Y., & Gross, J. J. (2007). Business or pleasure? Utilitarian versus hedonic considerations in emotion regulation. *Emotion, 7*, 546–554.
- Tamir, M., John, O. P., Srivastava, S., & Gross, J. J. (2007). Implicit theories of emotion: Affective and social outcomes across a major life transition. *Journal of Personality and Social Psychology, 92*, 731–744.
- Tamir, M., & Mauss, I. B. (in press). Social-cognitive factors in emotion regulation: Implications for well-being. In I. Nyklicek, A. Vingerhoets, M. Zeelenberg, & J. Denollet (Eds.), *Emotion regulation and well-being*. Berlin, Germany: Springer.
- Vinokur, A., & Selzer, M. L. (1975). Desirable versus undesirable life events: Their relationship to stress and mental distress. *Journal of Personality and Social Psychology, 32*, 329–337.
- Webb, T. L., & Sheeran, P. (2008). Mechanisms of implementation intention effects: The role of goal intentions, self-efficacy, and accessibility of plan components. *British Journal of Social Psychology, 47*, 373–395.
- Williams, L. E., Bargh, J. A., Nocera, C. C., & Gray, J. R. (2009). The unconscious regulation of emotion: Nonconscious reappraisal goals modulate emotional reactivity. *Emotion, 9*, 847–854.