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Ironic effects of emotion suppression when recounting distressing memories

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Running head: ironic effects of emotion suppression

Abstract

Theories of ironic mental control posit that under conditions where effortful control is compromised, for example in laboratory manipulations of mental load or in those suffering from clinical levels of negative affect, attempts to suppress negative emotions can lead to a paradoxical increase in such feelings, relative to conditions where no suppression is attempted. In line with this, we showed that high negative affect participants, when asked to suppress (down-regulate) their negative feelings while writing about a distressing personal memory, exhibited an ironically greater increase in negative emotions compared with a no instruction condition, in contrast to low negative affect controls who were able to suppress their emotions. Comparable ironic effects were not associated with instructions to experience emotions. This first demonstration of ironic effects of emotion suppression in response to personal material in those with emotional problems sheds light into how certain emotion regulation strategies may maintain and exacerbate such conditions.

Introduction

At times we have all tried and failed to wrest ourselves from the grip of a debilitating negative mood, with our efforts often making us feel paradoxically worse than before. When emotion regulation goes awry in this way it can have negative emotional and cognitive consequences, and potentially become a factor in mental ill health (Campbell-Sills, Barlow, Brown & Hofman, 2006; Garnefski & Kraaij, 2006; Gross, 2007; Kashdan & Breen, 2008; see Rottenberg & Gross, 2007, for a discussion).

Experimental work by Wegner and colleagues provides insight into why emotion regulation efforts sometimes fail. Wegner, Erber and Zanakos (1993) asked healthy participants to recount a distressing event in their lives using stream-of-consciousness writing. While doing so, some of the participants were asked to down-regulate (suppress) their emotions and not feel upset by the memory, whereas others (the control group) were given no regulation instructions. The data showed that suppression worked as intended with lower reports of negative mood in the suppress condition, relative to controls. Another two groups of participants repeated the above tasks but under a cognitive load (remembering a 9 digit number). This time, participants in the suppress condition reported relatively *more* negative affect than controls.

Wegner accounts for these data, and many others in diverse cognitive domains (see Wegner, 1994), in terms of 'ironic process theory'. This posits that ironic effects of attempted regulation can occur by virtue of those processes that permit effective control on most occasions. Two complementary processes are proposed. The first is an effortful operating process that carries out the regulation; for example, by searching for mental contents that counteract the undesired mood and bringing them into awareness. The second is an automatic monitoring process that scans the contents of awareness to evaluate the success of regulation attempts. This latter process activates representations of the to-be-regulated state as points of reference during monitoring, thus increasing the likelihood that such representations will ironically enter awareness. Under most conditions the operating process is more effective at introducing content into awareness than is the monitoring process. However, under conditions where the effortful operating

process is undermined, such as during mental load, the unabated continuation of automatic monitoring, with its associated subtle priming of the to-be-regulated material, is sufficient to cause an ironic increase in the to-be-regulated state.

Ironic process theory and the results reported by Wegner et al. (1993) have potentially important implications for understanding failures of emotion regulation in those with chronically high negative affect such as depression or anxiety (e.g. Kashdan & Steger, 2006; Rottenberg & Gross, 2007). The hypothesis is that, when faced with an unpleasant emotion, chronically high negative affect can itself act as a mental load, soaking up the mental resources that could otherwise be employed in suppressing that emotion. There is already good evidence using tight experimental designs that this occurs in the case of thought suppression in those with mental health problems (Purdon, 1999). Similar findings are also emerging when individuals are asked to down-regulate their emotion to non-autobiographical material such as film clips (e.g. Campbell-Sills, Barlow, Brown & Hoffman, 2006). The present study sought, for the first time to our knowledge, to demonstrate similar effects in the domain of emotion suppression in response to *personal* material by using the task developed by Wegner et al. (1993) with individuals with clinical levels of negative affect. Our key hypothesis was that high negative affect participants, compared with low negative affect controls, would suffer from an ironically more marked worsening of their emotional state when attempting to suppress negative feelings, relative to a no instruction control condition.

There are hints in the clinical literature on paradoxical intervention that the mechanics of ironic control theory can be harnessed to improve mood in those with chronic negative affect by counterintuitively asking them to accentuate, or up-regulate, their negative feelings. The rationale is that this should bring about an ironic *decrease* in negative affect (Beck & Strong, 1982; Feldman, Strong & Danser, 1982). For example, Feldman et al. (1982) found that informing depressed individuals that their depression was something useful and should be fully experienced led to a paradoxical remission of symptoms. That said, the extensive literature on rumination and mood amplification in people with affective disorders (see Watkins, 2008) would suggest that attempts at

mood enhancement in those with high affect would be more successful than for low-affect controls. To investigate these contrasting possibilities further we also included an experimental condition where participants were asked to enhance their negative feelings, although we had no clear hypotheses about performance in this condition relative to the no instruction condition across groups.

Method

Participants

Twenty-eight community volunteers (16 women; mean age=44.11 years, SD=16.92) were recruited from the CBU volunteer panel, selected on the basis of depression and anxiety symptom severity during previous studies to ensure a broad negative affect distribution . Participants were allocated to high (High-NA) or low (Low-NA) negative affect groups using established clinical cut-offs on the Hospital Anxiety and Depression Scale (HADS). Specifically, individuals who scored 8 or more on either the HADS-Anxiety or HADS-Depression sub-scales at the time of the study were allocated to the High-NA group, based on research indicating that these cut-offs provided the optimal sensitivity for clinical disorders (Olsson, Mykletun, & Dahl, 2005). All individuals in the High-NA group had scored in the moderately- to severely-depressed range on the Beck Depression Inventory – a widely used measure of depressive symptomatology (Beck, ward, Mendelson, Mock & Erbaugh et al., 1961) – on their previous attendance at the CBU to take part in research. Furthermore, all participants in the High-NA group had reported a history of problems with depression or anxiety upon joining the volunteer panel. In the Low-NA group, two participants had scored in the moderate range on the BDI at prior testing but had not described themselves as depressed or anxious at the time of panel recruitment. Demographic information and HADS scores for the two groups are in Table 1.

Measures

Emotion regulation task

The emotion regulation task and instructions were drawn directly from Wegner et al. (1993). Participants were first asked to take some time to identify three upsetting events from their past lives that they would subjectively rate as comparably distressing. Participants were then exposed to three different counterbalanced emotion regulation conditions in a within-subjects design, one for each of their three identified event memories.

In the No Instruction condition participants were asked to think about their memory while writing down their stream-of-consciousness (SOC). They were encouraged to imagine the original event as vividly as possible, in all of its detail, with as many sensory qualities as they could. Participants were told not to try and regulate their emotions at all but to go with the feelings that this memory naturally generated. In the Suppress condition the same instructions were followed for a different memory, except this time participants were encouraged to suppress any emotions that they felt. We used a general 'suppress' instruction, as opposed to a method designed to tease apart different emotion regulation strategies (cf., Gross, 1998), as this follows most logically from the thought suppression literature, and the work on emotion suppression in unselected participants, from the Wegner laboratory (Wegner et al., 1993; Wegner, 1994). Finally, in the Experience condition participants were instructed to accentuate their emotions.

Participants wrote for 7 minutes in each condition. Between each condition participants carried out 10 minutes of numerical reasoning that piloting had shown to be effective in washing out acute emotional effects. Prior to the regulation task participants practiced SOC writing for 3 minutes.

Mood Measures

Emotions were measured pre/post each condition in the emotion regulation task firstly by asking participants to provide 7-point ratings using the adjectives connoting happy/sad feelings validated by Wegner et al (1993) as a single reliable factor: happy,

good, inspired (all reverse scored), sad, gloomy, and blue. On this measure, higher scores connote more negative feelings. In addition, participants completed two visual analogue scales (VAS) from 0-100 measuring happy feelings and sad feelings, where 0='this feeling was completely absent' and 100='this is the strongest that I have ever felt this feeling' (Dalgleish & Yiend, 2006). Due to high inter-correlations between these measures they were combined using a method of weighted averaging into a single Composite Mood Score, ranging from 0-100, where higher scores represent more negative mood.

In line with Wegner et al. (1993) an observer (JY) who was blind to condition and participant group later rated the SOC narratives in their original script on a 7 point scale with higher scores signaling a more negative tone. The scale was anchored "not at all negative" to "extremely negative". A random sample of 20 protocols was second rated in the same way and the two sets of ratings were highly correlated, r=.71, consistent with Wegner et al.'s findings. Observer ratings enabled objective evaluation of the comparability of the memory narratives across participants.

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983)

The HADS is a self-report measure of experienced anxiety and depression. It has sound psychometric properties, generating a reliable two-factor (Anxiety, Depression) solution, with mean Cronbach's alphas of.82 and .83, respectively, across studies. It has clinical caseness sensitivity and specificity of 0.80 for both subscales, using our adopted cut-offs of 8 (Bjelland, Dahl, Haug, & Neckelmann, 2002).

Procedure

Participants gave written informed, consent and were then tested individually in a quiet testing room, first completing the HADS, then the regulation task. They then responded to a simple post-study audit asking them whether they had tried to suppress or enhance (yes/no) in each condition. Finally, participants were debriefed and paid an honorarium.

Results

Participant information

The high-NA and low-NA groups were comparable on gender ratio, χ^2 (df = 1) = .78, n.s., but the low NA group was significantly older, *t* (25.07) = 2.29, *P* = .03. Age was therefore subsequently controlled for in the relevant analyses. As expected the high NA group scored significantly higher on both HADS-Anxiety and -Depression, *t*s (26) > 5.00, *P*s < .001.

To assess mood at study entry we examined participants' scores on the Composite Mood measure prior to the first emotion regulation condition. As expected, the High NA group scored higher than the low NA group, indicative of more negative mood, at study entry (High NA: *M* = 37.28, *SD* = 13.78; Low NA: *M* = 22.14, *SD* = 11.81), *t* (26) = 3.13, *P* < .005.

Emotion regulation performance

All participants reported trying to suppress, but not enhance, and trying to enhance, but not suppress, for the Suppress and Experience conditions respectively on our simple post-study audit. They reported no efforts to enhance or suppress in the No Instruction condition.

As this was a within-subjects design, all of the following analyses were initially performed with condition Order as a factor/covariate. There were no significant effects involving order, *P*s > .7, and the patterns of results were identical with order included in the analyses. Consequently, analyses without order included are reported below.

We first examined the observer ratings of the negativity of the memory narratives to verify that the groups were generating comparably negative recollections. These observer-ratings of negative mood for the three memory narratives across conditions for the 2 groups are presented in Table 1. For one participant in the High NA group and 3 participants in the Low NA group one or more of the narratives were insufficiently legible to rate and these data were set aside. A repeated measures ANOVA with Condition as the within-subjects factor and Group as the between-subjects factor revealed no main effect of Group, *F* < 1, but there was a weak trend for a main effect of Condition, *F* (2, 44) = 2.55, *P* = .09. Within-subjects contrasts indicated that across all participants as

one might expect, the narratives in the Experience condition were rated as more negative than the narratives in the No Instruction condition, F (1, 22) = 5.23, P < .05. There were no other differences between condition pairs, Fs < 2.40, Ps > .14. Importantly, the Condition x Group interaction did not approach significance, F < 1, thus providing no support for the profiles of memories being different for the two groups.

To verify that the neutral distraction tasks between conditions to wash out mood were effective we compared the baseline mood ratings across the three conditions. There was no difference across conditions, F < 1.

The individual pre-narrative and post-narrative means for the Composite Mood Score for the three conditions (No Instruction, Suppress, Experience) are shown in Figure 1. To index emotion change for each condition on the Composite Mood Score we subtracted pre-narrative from post-narrative scores, such that higher scores represent a greater increase in negative mood. We then examined mood change across conditions by group using two repeated measures ANOVAs. The first examined our *a priori* hypothesis that any increase in negative mood for the Suppress relative to the No Instruction condition would be greater in the High-NA group than in the Low-NA group. The second analysis compared the Experience versus No Instruction conditions, for which we had no clear *a priori* predictions.

For the Suppress versus No Instruction analysis, there were no significant main effects of Condition or Group, but there was a significant Condition by Group interaction (Figure 1), F (1, 26) = 4.31, P < .05, η_p^2 = .52, which was in line with our prediction. As can be seen from Figure 1, suppression led to a paradoxically greater increase in negative mood, relative to the No Instruction control condition, in the high-NA group, although this was non-significant, t < 1. In contrast, suppression led to a significantly lower increase in negative mood in the Low-NA group, relative to the No Instruction control condition, t (15) = 2.54, P < .03, indicative of effective suppression. To verify that this hypothesized significant Group by Condition interaction for the Suppress versus No Instruction analysis was not a function either of the groups differing in age or in

mood at baseline, we repeated the above analysis with these factors as covariates. The results remained comparable: Group by Condition, F (1, 24) = 4.20, P = .05, η_p^2 = .52.

For the Experience versus No Instruction analysis, there were no significant main effects or interactions, Fs < 2, Ps > .17. The direction of the mean scores (see Figure 1) indicates that for both groups the Experience condition led to a numerically lower rise in negative affect than the No Instruction condition, with the magnitude of this effect being numerically greater in the Low-NA group.

Correlational analyses

Although we used established cut-offs on the HADS to separate our participants into High- and Low-NA groups, we also wanted to capitalize on the greater power offered by a correlational design by examining the findings for the whole sample considering NA as a continuous variable. We therefore computed zero-order correlations between HADS-Depression and HADS-Anxiety and indices of emotion change for the Suppress condition minus the No Instruction condition (Suppress Index) and for the Experience condition minus the No Instruction condition (Experience Index) (See Table 2). With these indices a positive score therefore indicates an increase in negative mood following attempted regulation (Experience or Suppress) compared to the No Instruction condition and a negative score represents a decrease. As is clear, the results for the Suppress Index are consistent with the previous findings (see Figure 1) with higher HADS scores relating to a relatively greater *increase* in negative emotion when trying to suppress relative to the No Instruction condition. Interestingly, the effects are now also significant for the Experience manipulation, where similarly higher HADS scores relate to a relatively greater *increase* in negative emotion when trying to experience relative to the No Instruction condition

Discussion

The present study uses an experimental design to show, for the first time to our knowledge, paradoxical effects of effortful attempts to down-regulate negative mood to distressing autobiographical material in individuals with clinical levels of negative affect,

relative to low negative affect controls who appear able to suppress negative mood. The data complement existing experimental findings on effortful thought suppression (Purdon, 1999), emotion-suppression using non-personal material (Campbell-Sills et al., 2006) and correlational data revealing associations between emotion regulation for personal material in daily life and worse mood in anxious samples (e.g. Kashdan & Steger, 2006). The results thus illustrate the potential importance of theoretical ideas concerning ironic mental control for the understanding of mental health. The implication is that successful down-regulation of negative mood in those suffering from depression or anxiety may best be achieved via strategies other than suppression; for example, reappraisal of the source material (Gross, 2002; Schartau, Dalgleish & Dunn, 2009) or acceptance of negative feelings (Hayes, Wilson, Strosahl, Gifford, & Follette, 1996). Future studies should therefore prioritise examination of the ironic effects of a range of specific regulation strategies in clinical samples.

Our exploratory analyses revealed no support for comparable ironic effects associated with attempted enhancement of negative mood. Indeed, the direction of the means was consistent with a relatively greater increase negative mood (in relation to the No Instruction condition) when attempting to enhance such mood in the High-NA group compared with the Low-NA group. Although this was not statistically significant in the group analyses, it became significant in the correlational analyses considering HADS scores as continuous variables. It may be that ironic effects of mood regulation are stronger for the attempted elimination of undesired mental states as opposed to the exacerbation of existing ones (Watkins, 2008). Alternatively, as it is likely that any self-loading effects of depression and anxiety will vary across situations, it may be that chronic negative affect only acts as a mental load when negative feelings are to be suppressed rather than enhanced.

Overall, the current findings add to the literature suggesting that such effortful attempts to down-regulate unwanted emotions can come at a price. Even when ironic relative rises in mood do not occur as they did the present study, previous work has shown that there can be undesirable effects on social and cognitive functioning and even

physical health (e.g., Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Gross & John, 2003; Muraven, Tice, & Baumeister, 1998; Polivy, 1998; though see Dunn, Billotti, Murphy, & Dalgleish, in press). Given these deleterious downstream consequences of effortful emotion down-regulation, it would be interesting to examine the nature and effects of *automatic* emotion regulation processes (Bargh & Williams, 2007; Mauss, Bunge & Gross, 2007; Mauss, Cook & Gross, 2006) in those with high negative affect to assess whether similar ironic processes were in operation when voluntary efforts at regulation were minimized.

Some aspects of the data and methodology merit discussion. First, the results rely on self-report of emotion state and may therefore be susceptible to demand effects. However, it seems unlikely that demand effects would have led High-NA participants to report an ironically *greater* increase in negative mood when trying to suppress (relative to No Instruction). Rather, demand effects should have led to the opposite pattern of results. Second, the sample size in the High-NA group is modest. However, there is no indication that power was insufficient for the key analyses examining our a priori predictions and the replication of these core results with group and correlational analyses that take advantage of the greater power available with this approach is reassuring. That said, it may be that the group analyses comparing the Experience versus No Instruction conditions would have reached statistical significance with a larger sample size and thus mirrored the significant correlational results examining this contrast. Third, although the focus of the present study was on emotion regulation in individuals high or low in negative affect, it may be that some unmeasured third variable associated with these groupings is central in driving the current pattern of findings. The study would therefore have been strengthened by assessing individual differences in emotion regulation strategies (Gross & John, 2003) and in broader aspects of executive control (Schmeichel, Volokhov & Demaree, 2007) to shed light on such possibilities. Finally, we did not elicit subjective ratings of the emotive impact of the memories that participants generated, relying instead on observer ratings. Neither did we carry out a sophisticated manipulation check to verify compliance with the condition instructions, relying instead

on a simple yes/no post-study survey. Both of these design issues are limitations of the current research.

In summary, the present data reveal paradoxical effects of emotion suppression in response to distressing autobiographical material in those with emotional difficulties. The findings extend work on ironic mental control in the mainstream cognitive psychology literature into the clinical domain and offer important insights into why individuals with mental health problems struggle to regulate their emotions effectively.

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Table 1

Observer rated and self-report mood measures for the High- and Low-Negative Affect (NA) groups

	Low-NA (*n*=16)	High-NA (*n*=12)
Age	50.25 (18.34)	35.91 (10.78)
Sex ratio (M: F)	8:8	4:8
HADS-Depression	1.81 (1.28)	7.75 (3.93)
HADS-Anxiety	4.88 (2.09)	13.42 (2.71)
Observer-No Instruction	5.17 (.83)	5.07 (.88)
Observer-Suppress	5.18 (1.08)	5.27 (1.10)
Observer-Experience	5.64 (1.43)	5.69 (1.11)

Note

Data, except for sex ratio, are Mean (*SD*)

No Instruction/Suppress/Experience = mood regulation conditions

HADS = Hospital Anxiety and Depression Scale

Table 2

Pearson correlations between Hospital Anxiety and Depression Scale (HADS) scores (depression [D] and Anxiety [A] subscales) and the Suppress and Experience Indices of relative mood change

	HADS-A	HADS-D
Suppress Index	.51**	.76***
Experience Index	.40*	.62***

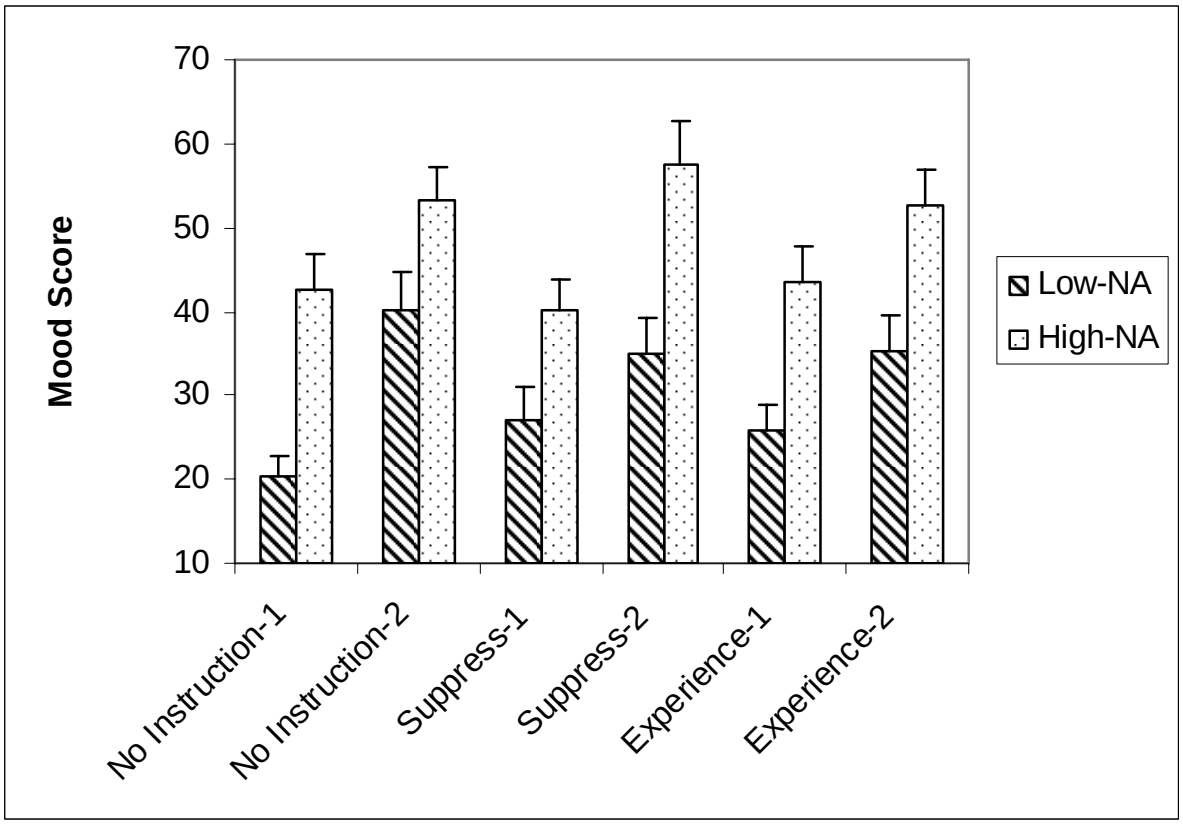
Note

*** = p < .001; ** = p < .01; * = p < .05

Figure 1

Mean (+ 1 *S.E.*) composite mood scores for the Low- and High-Negative Affect (NA) groups for the Suppress, Experience and No Instruction conditions.

Figure 1


Mood Score
70
60
50
40
30
20
10
No Instruction-1
No Instruction-2
Suppress-1
Suppress-2
Experience-1
Experience-2
Low-NA
High-NA