Online Supplement

**Power analysis**

A G\*Power (Version 3.1.9.3; Faul et al., 2007) power calculation for a one-sample *t* test against 0 was used because it is identical to that of a two-way repeated-measures analysis of variance (ANOVA) in which both within-subject factors contain exactly two levels. For an effect size of Cohen’s *d* = 0.26 (an arbitrary conservative effect size of small to medium degree), 80% power, and = .05, the resulting sample size was calculated as *N* = 119. Thus, the study was sufficiently powered to detect small-to-medium-sized effects.

**Participant Characteristics and Manipulation Checks**

***Measures***

Regarding participant characteristics, the State-Trait Anger Expression Inventory – Trait version (STAXI-Trait; Spielberger, 1988, [blinded for review process]) was used to assess participants’ general experience, expression, and control over anger; the Beck Depression Inventory–II (BDI-II; Beck et al., 1996; [blinded for review process]) assessed depressive symptoms; the Perseverative Thinking Questionnaire (PTQ; Ehring et al., 2011) assessed the general tendency to engage in repetitive thinking; and the Rumination subscale of the Anger-Related Reactions and Goals Inventory (ARGI; Kubiak et al., 2011; [blinded for review process]) assessed anger-related rumination. The trait measures’ internal consistencies in our study were good to excellent with Cronbach’s α = .85 for the STAXI-Trait, α = .93 for the BDI-II, α = .94 for the PTQ, and α = .90 for the ARGI Rumination subscale.

Following Fabiansson et al. (2012), ratings of current anger (“How angry do you feel right now when you are thinking back to the event?”) and happiness (“How happy do you feel right now when you are thinking back to the event?”) were used as indicators of the consequences of focusing on the anger event. Additionally, participants were asked to rate the intensity of their recall when focusing on the anger event (“Please think back to the event you recalled just now…. How intense is the memory [of this event] at the moment?”) to verify that participants’ memory recall was sufficiently intense, as well as to investigate whether intensity ratings were comparable in the two ruminative mode conditions. All three items were rated on a scale of 0 (*not at all*) to 10 (*extremely*).

As manipulation checks, participants rated their degree of self-focus during rumination on a scale of 0 (*not at all focused on self*) to 10 (*very focused on self*), based on Wong and Moulds (2012). Additionally, the degrees of abstractness and concreteness of rumination were assessed with three items each, adapted from Fabiansson et al. (2012). For abstractness, the items were “To what extent did you think… (a) about the meaning of the event (e.g., on how you can explain your feelings)?; (b) about the consequences of the event?; (c) about the reasons for the event (e.g., on why things developed this way)?”; for concreteness, the items were “To what extent did you focus on… (a) the concrete experience during the event (e.g., on your feelings back then)?; (b) your feelings relating to the other person?; (c) your sensations and feelings during the event in general?”. All six items were rated on 7-point Likert scales of 1 (*not at all*) to 7 (*extremely so*). Internal consistencies were lower in Phase 1 of the experiment and acceptable in Phase 2, with Cronbach’s = .62 (Phase 1) and = .79 (Phase 2) for abstractness and = .69 (Phase 1) and = .82 (Phase 2) for concreteness.

***Analyses***

Possible differences on participant characteristics between the groups allocated to the two orders of ruminative mode inductions were investigated using independent-samples *t* tests. For self-focus, potential differences between ruminative modes were analyzed using paired-samples *t* tests. Regarding abstractness vs. concreteness manipulation checks (outcome), a two-way repeated-measures ANOVA with the focus of the manipulation check (abstractness vs. concreteness) and allocated ruminative mode (abstract vs. concrete) as within-subject factors was used. We expected a significant interaction effect between rated and allocated ruminative mode, indicating a successful induction of two different ruminative modes. For all analyses, the assumption of normality was checked using histograms and q-q plots. For the independent-samples *t* tests, bootstrap was used to confirm results when normality could not be assumed, and Welch’s approximate *t* test was used when variance homogeneity was violated. We report Cohen’s *d* for independent-samples, corrected Cohen´s *d* for paired-samples *t* tests and for *F* tests.

***Results***

Supplemental Table 1 displays descriptives for participant characteristics and manipulation checks as well as effects of order on participant characteristics and of ruminative modes on self-focus. There were no effects of the order of ruminative mode inductions on participant characteristics and self-focus during the ruminative mode inductions did not differ significantly between the two ruminative modes. Importantly, there was a medium-to-large interaction effect between the focus of the two manipulation checks (abstractness vs. concreteness sum scores) and allocated ruminative mode (abstract vs. concrete rumination) on abstractness or concreteness sum scores, *F*(1, 118) = 12.08, *p* = .001, = .09. Our results indicate that after abstract versus concrete ruminative mode inductions, participants’ abstractness versus concreteness levels differed in the expected direction; thus, we successfully induced two different ruminative modes.

**Table 1**

*Descriptives, Cronbach’s , and Test Statistics for Participant Characteristics and Manipulation Checks*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | *M* (*SD*) | | *t* | *df* | *p* | *d* |
|  | Group: AC | Group: CA |  |  |  |  |
| Age | 28.03 (11.98) | 25.65 (9.84) | 1.19 | 117 | .24 | –0.22 |
| Trait anger (STAXI-Trait) | 18.19 (5.21) | 19.10 (5.45) | –0.92 | 117 | .35 | 0.17 |
| Depressive symptom severity (BDI-II) | 11.92 (9.72) | 10.08 (8.90) | 1.07 | 117 | .29 | –0.20 |
| Repetitive negative thinking (PTQ) | 25.19 (13.11) | 26.32 (12.30) | –0.48 | 117 | .63 | 0.09 |
| Anger-related rumination (ARGI-Rum) | 8.81 (3.05) | 9.07 (3.17) | –0.44 | 117 | .66 | 0.08 |
| T1 ratings |  | |  |  |  |  |
| Anger | 6.27 (2.62) | 5.95 (2.60) |  |  |  |  |
| Happiness | 2.25 (2.41) | 2.42 (2.23) |  |  |  |  |
| Intensity | 6.22 (2.57) | 6.15 (2.02) |  |  |  |  |
| T4 ratings |  | |  |  |  |  |
| Anger | 5.00 (2.53) | 4.80 (2.61) |  |  |  |  |
| Happiness | 2.53 (2.42) | 3.13 (2.28) |  |  |  |  |
| Intensity | 5.58 (2.47) | 5.37 (2.02) |  |  |  |  |
| Manipulation checks | After AR | After CR |  |  |  |  |
| Focus on self | 6.60 (2.33) | 6.76 (2.22) | –0.73 | 118 | .47 | 0.09 |
| Abstractness | 15.24 (3.65) | 14.35 (3.64) |  |  |  |  |
| Concreteness | 15.03 (3.38) | 15.62 (3.81) |  |  |  |  |

*Note.* *N* = 120. Data for participant characteristics, T4 ratings, and abstractness vs. concreteness manipulation checks (MCs) were missing for one participant. AC = group allocated to first abstract, then concrete ruminative modes; AH = anger vs. happiness rating; AR = abstract rumination; ARGI-Rum = Rumination subscale of the Anger-Related Reactions and Goals Inventory; BDI-II = Beck Depression Inventory–II; CA = group allocated to first concrete, then abstract ruminative modes; CR = concrete rumination; *d* = Cohen’s *d* for order effects and corrected Cohen’s *d* for effects of AH and ruminative mode (RumMode); PTQ = Perseverative Thinking Questionnaire; STAXI = State-Trait Anger Expression Inventory.

**Table 2**

*Study Phase Effects on Anger, Happiness, and Intensity Ratings, and Order Effects on Manipulation Checks and Main Analyses*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Effect | Test statistic | | | |
|  |  | *F* | *df* | *p* |  |
| T1 and T4 Ratings |  |  |  |  |  |
| Anger and Happiness | Study Phase × Measure | 31.48 | 1, 118 | < .001 | .21 |
| Intensity | Study Phase | 12.18 | 1, 118 | < .001 | .09 |
|  |  |  |  |  |  |
| Manipulation Checks |  |  |  |  |  |
| Focus on self | Order × RumMode | 2.72 | 1, 117 | .10 | .02 |
| Abstractness and Concreteness | Order × MC × RumMode | 3.75 | 1, 117 | .06 | .03 |
|  |  |  |  |  |  |
| Main Analyses |  |  |  |  |  |
| Anger (STAXI-State)a | Order × Time | 1.44 | 1, 117 | .23 | < .001 |
|  | Order × RumMode × Time | 2.98 | 1, 117 | .09 | .02 |
| Negative affect (PANAS NA)a | Order × Time | 0.44 | 1, 117 | .51 | .004 |
|  | Order × RumMode × Time | 0.05 | 1, 117 | .82 | < .001 |
| Positive affect (PANAS PA) | Order × Time | 0.14 | 1, 117 | .32 | .01 |
|  | Order × RumMode × Time | 30.44 | 1, 117 | < .001 | .21 |

*Note.* MC = manipulation check outcome variable (abstractness vs. concreteness);Order = order of ruminative mode inductions (abstract vs. concrete ruminative mode first); PANAS PA = Positive Affect subscale of the Positive and Negative Affect Schedule; PANAS NA = Negative Affect subscale of the Positive and Negative Affect Schedule; RumMode = ruminative mode; Study Phase 1 = T0 to T2; Study Phase 2 = T3 to T5.

aValues were log transformed prior to hypothesis tests but not for means and standard deviations

**References**

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