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Effects of abstract versus concrete rumination about anger on affect

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Abstract

Background: The processing-mode theory of rumination proposes that an abstract mode of rumination results in more maladaptive consequences than a concrete ruminative mode. It is supported by evidence mostly from the area of depression and little is known of the relative consequences of abstract versus concrete rumination for anger.
Aims: We investigated the differential effects of abstract versus concrete rumination about anger on individuals' current affect. We hypothesized that abstract rumination would increase current anger and negative affect, and decrease positive affect, to a greater extent than concrete rumination.
Method: In a within-subject design, 120 participants were instructed to focus on a past social event that resulted in intense anger and then to ruminate about the event in both an abstract and a concrete mode, in a randomly assigned order. Current anger, negative and positive affect were assessed before and after each rumination phase.
Results: Anger and negative affect increased and positive affect decreased from pre- to post-rumination. Contrary to expectations, these patterns were observed irrespective of the ruminative mode induced.
Conclusions: This initial study does not support the hypothesis that abstract and concrete rumination about anger have different consequences for current affect. Replications and more extensive designs are needed.

Keywords: affect; anger; processing mode; rumination (cognitive process); ruminative mode

Introduction

Rumination is a repetitive thought process associated with a wide range of adverse consequences (e.g. Ehring and Watkins, 2008; Nolen-Hoeksema *et al.*, 2008). The processing-mode theory of rumination distinguishes an abstract from a concrete mode of rumination (Watkins *et al.*, 2008). Abstract rumination is characterized by predominantly analytical, decontextualized and evaluative thinking, whereas a concrete ruminative mode is more experiential, situation specific, and less evaluative (Watkins *et al.*, 2008). The processing-mode theory emerged from research on depression, in which rumination is typically defined as 'a mode of responding to distress that involves repetitively and passively focusing on symptoms of distress and on the possible causes and consequences of these symptoms' (Nolen-Hoeksema *et al.*, 2008; p. 400). Little research exists on the differential effects of abstract versus concrete rumination in the context of anger. To illustrate the two ruminative modes in the context of anger, after arguing with a colleague, ruminating in an abstract mode may include thoughts such as 'Why does this [always] happen to me?' (Van Lier *et al.*, 2015; p. 35). In contrast, more concrete rumination could include thoughts such as 'What exactly did I say first?' (Van Lier *et al.*, 2015; p. 35). For the purposes of

this paper, we use the terms *abstract* and *concrete* to refer to the two modes of rumination described by the processing-mode theory. This theory predicts that abstract rumination has maladaptive consequences, and concrete rumination more adaptive consequences, for affect[1] and cognitive processes (Watkins *et al.*, 2008).

Multiple studies have supported the processing-mode theory by demonstrating differential effects of abstract versus concrete rumination on various cognitive processes relevant to depression (e.g. on over-general memory: Watkins and Teasdale, 2001; or on self-judgements of worthlessness and incompetence: Rimes and Watkins, 2005; Vassilopoulos and Watkins, 2009). However, results from experiments that have examined the effects of ruminative modes on affect are somewhat mixed. Rimes and Watkins (2005) demonstrated that abstract rumination about oneself and one's symptoms increased depressed mood, compared with concrete rumination, in depressed individuals. More recently, Kambara *et al.* (2019) demonstrated that in students, ruminating on a recent failure experience in an abstract way maintained negative affect, whereas concrete rumination decreased it (however, note there were no effects on positive affect). Similarly, Werner-Seidler and Moulds (2012) showed that whereas abstract rumination on positive memories maintained sadness, concrete rumination on positive memories decreased it. On the other hand, some experiments have demonstrated that effects on affect did not differ for rumination about oneself and one's symptoms in an abstract and a concrete mode (e.g. effects on sadness: Sanders and Lam, 2010; on negative affect: Watkins and Moulds, 2005; on despondency and happiness: Watkins and Teasdale, 2001). Furthermore, some studies have shown differential effects of ruminative modes on affect only under specific conditions, for example, in a sample of individuals diagnosed with depression but not for those without such a diagnosis (Rimes and Watkins, 2005), or subsequent to a failure experience after rumination, but not following the rumination induction itself (Watkins *et al.*, 2008).

Rumination is considered a transdiagnostic factor relevant to many affective or behavioural experiences and mental disorders (e.g. Ehring and Watkins, 2008). Multiple studies have investigated the processing-mode theory in various conditions other than depression (or dysphoria), such as social anxiety (Van Lier *et al.*, 2015; Vassilopoulos and Watkins, 2009; Wong and Moulds, 2012), schizophrenia (Ricarte *et al.*, 2018a; Ricarte *et al.*, 2018b), and alcohol dependence (Grynberg *et al.*, 2016; for an overview of different conditions see also Watkins and Roberts, 2020), as well as in the context of symptoms such as intrusive memories (Santa Maria *et al.*, 2012; Schaich *et al.*, 2013; Stavropoulos and Berle, 2020). Most of these studies have reported no differential effects of abstract and concrete rumination on affect (e.g. negative affect in Santa Maria *et al.*, 2012; Schaich *et al.*, 2013; anxious and depressed mood in Vassilopoulos and Watkins, 2009).

There is also some evidence that rumination plays a role in the processing of anger. For instance, experimental studies have shown that ruminating about anger increases or maintains anger, compared with reappraisal or distraction (Aboulafia-Brakha *et al.*, 2016; Lievaart *et al.*, 2017; Peuters *et al.*, 2019; Ray *et al.*, 2008; Takebe *et al.*, 2017). To our knowledge, however, no study has directly tested the differential effects of abstract and concrete rumination (as described by the processing-mode theory) about anger on affect. However, it is noteworthy that several studies from a different line of research (e.g. Denson *et al.*, 2012; Kross *et al.*, 2005; Pfeiler *et al.*, 2017) have examined the differential effects of a 'cool' versus 'hot' focus of anger rumination. 'Cool' processing refers to 'cognitive, emotionally neutral, contemplative, flexible, integrated, coherent, spatiotemporal, slow, episodic, and strategic' thinking (Metcalfe and Mischel, 1999; p. 3) and could be considered similar to abstract rumination. 'Hot' processing is more emotional, fast and reflexive (Metcalfe and Mischel, 1999) and could be considered similar to concrete rumination. Kross *et al.* (2005) reported that after thinking about an autobiographical anger experience adopting a 'cool' processing mode, participants reported lower anger and negative

[1]For the purposes of this paper, we define affect broadly as 'an umbrella term for states that involve relatively quick good–bad discriminations' (Gross, 2014; p. 5), including states described as emotions or moods, and more specifically including anger.

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affect relative to thinking about it adopting a 'hot' processing mode. These results may be interpreted as inconsistent with the processing-mode theory. However, as 'cool' and 'hot' processing are not conceptually identical to abstract and concrete rumination (Watkins, 2008; p. 187), a study which directly examines the relative effects of abstract and concrete processing in rumination about anger is warranted. Accordingly, the aim of this initial study was to investigate the differential effects of abstract and concrete rumination about anger on participants' levels of self-reported current anger, negative affect, and positive affect. On the basis of the processing-mode theory, we hypothesized that abstract rumination would result in a greater increase in anger (Hypothesis 1) and negative affect (Hypothesis 2), and a greater decrease in positive affect (Hypothesis 3), relative to concrete rumination.

Method

Participants and design

$N = 120$ (102 female) students and individuals from the community were recruited during lectures and using advertisements on two websites of the same university. They participated in the experiment in exchange for either course credit or gift vouchers. The experiment was double blinded. It had a 2×2×2 mixed-subject design, with ruminative mode (abstract versus concrete rumination about anger) and time (pre- versus post-rumination) as within-subject factors and order of ruminative modes (i.e. abstract versus concrete ruminative mode first) as a between-subject factor. However, the main analyses use a 2 (ruminative mode) × 2 (time) within-subject design after investigating order effects. Rumination about anger was operationalized as rumination about anger that resulted from a previous social situation which still caused current anger when recalling the event. We use the shorter phrase 'rumination about anger' hereafter.

Measures

State anger was assessed with the State-Trait Anger Expression Inventory-State version with possible scores ranging from 10 to 40 (STAXI-State; Spielberger, 1988; German version by Schwenkmezger *et al.*, 1992), and current negative and positive affect were assessed with the two subscales (each ranging from 10 to 50) of the Positive and Negative Affect Schedule (PANAS NA and PA, respectively; Watson *et al.*, 1988; German version by Krohne *et al.*, 1996). To mask the study's aim, we added the 10 state items from the State-Trait Anxiety Inventory (Spielberger *et al.*, 1970; German version by Laux *et al.*, 1981) to the STAXI-State. Measures to assess participant characteristics, manipulation checks to assess participants' current anger, current happiness, the intensity of their recall when focusing on the anger, self-focus during rumination, and the degree of abstractness and concreteness of rumination during the ruminative mode inductions are described in the Supplementary material online.

Tasks

Identification and focus on an anger-provoking social event

At the beginning of the experiment, participants were asked to recall a social event within the past 12 months[2] that resulted in them feeling intense anger (i.e. at the time of the event), and still caused them to feel angry when they recalled it (i.e. at the time of the experiment). If needed, participants received up to two prompts reminding them of the criteria and providing examples.[3]

[2]Subsequent analyses showed that the average time since the event was $M = 3.73$ months ($SD = 3.70$; calculated for a subsample of $n = 67$; the question assessing the time that had passed since the event had occurred was only included after the first 53 participants had already been tested.

[3]Subsequent analyses showed that $n = 116$ participants had identified an event without needing a prompt. Only $n = 4$ participants received the first prompt, and no participants required a second prompt.

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At two time points during the experiment, participants were asked to recall the event they had previously identified for 20 seconds ('Please take a moment to bring a clear memory of the event you identified before to mind').

Ruminative mode inductions

The inductions of abstract and concrete ruminative modes were based on inductions that have been successfully implemented in multiple previous experiments across different areas (e.g. in the area of depression: Rimes and Watkins, 2005; or in the area of social anxiety: Wong and Moulds, 2012). Participants were instructed to concentrate on 18 consecutively presented statements. The overall induction procedure was based on those used by Rimes and Watkins (2005) and Watkins and Moulds (2005), and the instructions were adapted from Wong and Moulds (2012) and Fabiansson *et al.* (2012). In the abstract ruminative mode condition, participants were asked to focus on the causes, meanings and consequences of the anger event ('As you read the items, use your imagination and concentration to think about the causes, meanings, and consequences of the [event]. Spend a few minutes concentrating on each item, attempting to make sense of and understand the issues raised by [the event]'; Wong and Moulds, 2012; pp. 1066–1067). In the concrete ruminative mode condition, participants were asked to focus on the concrete experience of the anger event ('As you read the items, use your imagination and concentration to focus your mind on each experience . . . [Spend a few minutes concentrating on your experience] attempting to find a phrase, image or set of words that best describes the quality of what you sense'; Wong and Moulds, 2012; p. 1067).

Sixteen ruminative mode induction statements were adapted from Nolen-Hoeksema and Morrow (1993; German translation by Huffziger & Kuehner, 2009), with two additional statements adapted from Fabiansson *et al.* (2012). In the abstract ruminative mode condition, each statement was preceded by the instruction 'Think about . . . ' and asked participants to think about a different aspect of the anger event in an abstract way (e.g. 'Think about the meaning of the event'). In the concrete ruminative mode condition, each statement was preceded by the instruction 'Focus your attention on your experience of . . . ' and asked participants to focus their attention on a different aspect of the anger event in a concrete way (e.g. 'Focus your attention on your experience of how exactly the event unfolded'). The two ruminative mode conditions were designed to be identical in self-focus (e.g. focus on motivation, or how passive or active one feels). Participants were allowed to navigate back and forth between the introductory text and the statements at their own pace for 8 minutes. Thus, they could take as much time as they needed to read through and concentrate on the aspects mentioned by each statement.

Procedure

At the start of the experiment, participants provided written informed consent. They were then told in more detail about the supposed aim of the study. In particular, they were informed that the study was investigating the interplay of memory, imagination and affect. Participants were tested in groups of up to four in the same room for practical reasons, with dividers placed between seats to minimize interruptions. All parts of the experiment were conducted on a computer. Participants were then randomly assigned to the order of ruminative modes using block randomization. The experimental procedure is displayed in Fig. 1.

Analyses

A power analysis was conducted to determine the sample size needed for small-to-medium effects (for details, see Supplementary material online). Analyses examining possible effects of order on participant characteristics and of ruminative modes on manipulation checks are described in the

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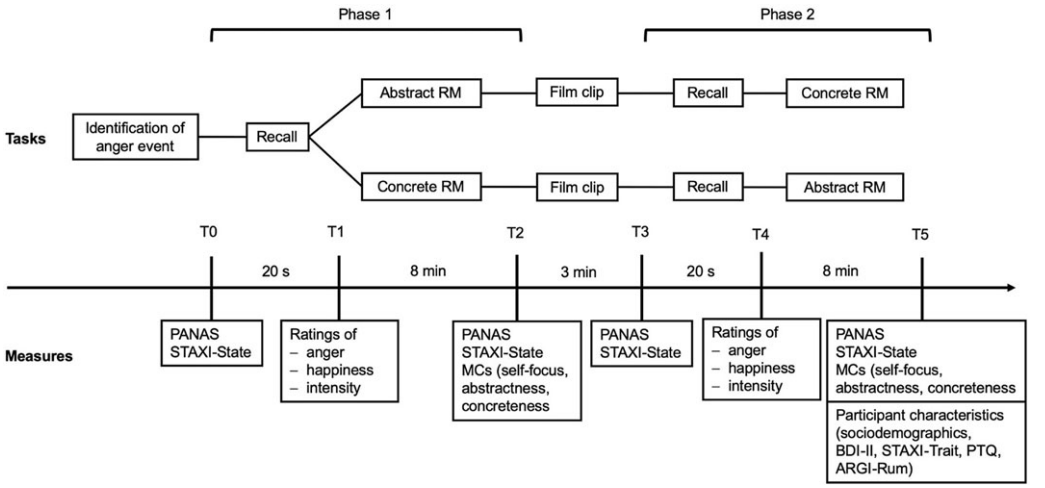

Figure 1. Experimental procedure. ARGI-Rum, Rumination subscale of the Anger-Related Reactions and Goals Inventory; BDI-II, Beck Depression Inventory-II; Film clip was a 3-minute film clip showing two people visiting different sights in Europe that was intended to reduce any possible carry-over effects from Phase 1 to Phase 2. MCs, manipulation checks; PANAS, Positive and Negative Affect Schedule; PTQ, Perseverative Thinking Questionnaire; RM, ruminative mode; STAXI, State-Trait Anger Expression Inventory.

Supplementary material. To examine whether the anger and happiness ratings immediately after focusing on the anger event differed by study phase, a repeated-measures ANOVA with the within-groups factors Study Phase (Phase 1 vs Phase 2) × Measure (anger vs happiness) and the outcome current anger or happiness rating was conducted. The analysis yielded an interaction effect of Study Phase × Measure on anger and happiness ratings (for statistical results, see Table S2 in Supplementary material). Thus, differences between current anger and happiness ratings were investigated separately for each study phase, using paired-samples *t*–tests. Mixed ANOVAs were used to investigate possible order effects on manipulation checks, STAXI-State, and the PANAS NA or PA (see Table S2 in Supplementary material for results). A three-way interaction effect of Order × Ruminative Mode × Time on PANAS PA emerged. Thus, the analyses for PANAS PA (Hypothesis 3) were conducted separately for Phases 1 and 2. For the other variables, no order effects emerged and the main analyses for STAXI-State and PANAS NA are presented for the two study phases combined.

For the main analyses, the main effect of time and the interaction effect of Ruminative Mode × Time (Hypotheses 1–3) on each outcome variable (STAXI-State, PANAS NA, and PANAS PA) were examined using two-way repeated-measures ANOVAs. The assumption of normality for all analyses was checked visually, using histograms and q-q plots. Residuals for STAXI-State and PANAS NA were not normally distributed and thus these outcome variables were log-transformed. We report corrected Cohen's *d* for paired-samples *t*–tests (interpretation based on Cohen, 1988) and η_p^2 for *F*-tests (interpretation as small: $\eta_p^2 = 0.01$, medium: $\eta_p^2 = 0.06$, or large: $\eta_p^2 = 0.14$, based on Richardson, 2011). The significance level was $\alpha = .05$ for all tests.

Results

Participant characteristics and manipulation checks

Participant characteristics did not differ between the two orders of ruminative mode inductions (see Table S1 in Supplementary material). Participants' average level of anger can be interpreted as moderate with $M = 6.11$ ($SD = 2.60$) for Phase 1 and $M = 4.90$ ($SD = 2.56$) for Phase 2. Happiness ratings were low with $M = 2.33$ ($SD = 2.31$) for Phase 1 and $M = 2.83$ ($SD = 2.36$)

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Table 1. Effects of ruminative modes and time on anger, negative affect and positive affect

Variable	Abstract RumMode *M* (*SD*)	Concrete RumMode *M* (*SD*)	Effect	Test statistic *F*	d.f.	*p*	η_p^2
Anger (STAXI-State)[a]							
Pre-rumination (Phases 1 and 2)	16.14 (6.53)	16.61 (7.16)	Time	16.53	1, 118	<.001	.12
Post-rumination (Phases 1 and 2)	17.34 (7.08)	17.69 (7.15)	RumMode × Time	<0.001	1, 118	.998	<.001
Negative affect (PANAS NA)[a]							
Pre-rumination (Phases 1 and 2)	17.83 (7.16)	17.34 (6.60)	Time	8.72	1, 118	.004	.07
Post-rumination (Phases 1 and 2)	18.35 (7.22)	18.43 (6.56)	RumMode × Time	1.15	1, 118	.29	.01
Positive affect (PANAS PA)							
Pre-rumination (Phase 1)	27.38 (5.96)	28.15 (6.97)	Time	39.66	1, 118	<.001	.25
Post-rumination (Phase 1)	25.12 (7.04)	25.33 (6.88)	RumMode × Time	0.46	1, 118	.50	.004
Pre-rumination (Phase 2)	28.83 (7.76)	28.81 (8.35)	Time	110.68	1, 117	<.001	.49
Post-rumination (Phase 2)	22.47 (7.32)	23.44 (7.11)	RumMode × Time	0.79	1, 117	.37	.01

$N = 120$ for Phase 1, $n = 119$ for Phase 2 or combined Phases 1 and 2. PANAS PA, Positive Affect subscale of the Positive and Negative Affect Schedule; PANAS NA, Negative Affect subscale of the Positive and Negative Affect Schedule; post-rumination, T2 or T5; pre-rumination, T0 or T3; RumMode, ruminative mode; STAXI, State-Trait Anger Expression Inventory. [a]Values were log-transformed prior to hypothesis tests but not for means and standard deviations.

for Phase 2. Ratings of the intensity of the anger memory at recall were moderate with $M = 6.18$ ($SD = 2.30$) for Phase 1 and $M = 5.47$ ($SD = 2.25$) for Phase 2. Participants reported higher ratings of current anger than happiness in both Phase 1 ($t_{119} = 10.29$, $p < .001$, $d = -1.33$) and Phase 2 ($t_{118} = 5.52$, $p < .001$, $d = -0.72$), with large effect sizes. Manipulation check analyses indicate that self-focus was comparable between the ruminative mode inductions and that we successfully induced ruminative modes that differed in abstractness versus concreteness levels as expected (for details, see Supplementary material online).

Effects on anger, negative affect, and positive affect

Table 1 displays untransformed means and standard deviations and results for the main analyses using log-transformed variables for the STAXI-State and PANAS NA. A main effect of time on anger indicated higher post-rumination than pre-rumination levels of anger, with a medium effect size. There was no significant Ruminative Mode × Time interaction, indicating that anger increased irrespective of ruminative mode. Similarly, a main effect of time on negative affect reflected higher post-rumination than pre-rumination levels with a medium-to-large effect size. The interaction of Ruminative Mode × Time was not significant. For positive affect, we analysed the two study phases separately because of order effects. For both study phases, a main effect of time indicated lower post-rumination than pre-rumination levels of positive affect with large effect sizes. Again, no Ruminative Mode × Time interaction effects emerged.

Discussion

The study investigated the immediate effects of abstract versus concrete rumination about anger on participants' levels of current anger, negative and positive affect. Both ruminative modes resulted in medium-to-large increases in current anger and negative affect, and a large decrease in positive affect. Contrary to expectations, there were no differences between the two ruminative modes in these changes over time. Thus, our hypotheses were not supported.

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Our results are inconsistent with the processing-mode theory (Watkins *et al.*, 2008), which would predict a larger increase in anger and negative affect, and a greater decrease in positive affect, following abstract relative to concrete rumination. However, our results are not completely surprising given that the short-term effects of ruminative modes on affect have not been consistently found in previous studies (e.g. Sanders and Lam, 2010; Watkins and Moulds, 2005; Watkins and Teasdale, 2001).

The lack of a significant interaction between ruminative mode and time is unlikely to be accounted for by an unsuccessful ruminative mode manipulation or by differences in self-focus: the manipulation checks demonstrated that participants ruminated in the instructed modes, and there were no differences between ruminative modes in self-focus. Moreover, similar ruminative mode inductions have successfully been used to induce abstract and concrete rumination in many previous studies (e.g. Rimes and Watkins, 2005; Wong and Moulds, 2012). Additionally, the lack of an interaction is unlikely to be due to insufficient power, because the present study was sufficiently powered to detect small to medium effect sizes for effects of Ruminative Mode × Time on anger, negative affect, and positive affect. While our findings are preliminary, should they be replicated in future studies, the question of whether ruminative modes have different consequences for anger than for depression will warrant discussion. Feeling angry or upset is associated with a higher level of activation than feeling depressed or sad (Yik *et al.*, 2011). One could speculate that for the high levels of activation associated with anger, a low-activation activity such as concrete rumination may not be strong enough to reduce anger. Instead, higher-activation distraction strategies such as listening to music or physical exercise (Rusting and Nolen-Hoeksema, 1998) may be more effective at reducing anger.

Several limitations of the present study should be considered. First, participants' anger levels were not more than moderate in our study. It is possible that the effects of ruminative modes might materialize only when anger is much more intense. In the area of depression, the maladaptive effects of rumination (typically operationalized as relatively abstract rumination following Nolen-Hoeksema and Morrow, 1993) on affect have often emerged only in dysphoric or depressed individuals (for overviews, see Nolen-Hoeksema *et al.*, 2008; Watkins and Roberts, 2020; however, see also Jahanitabesh *et al.*, 2019, who demonstrated effects of rumination on negative affect in students irrespective of baseline affect). On a related note, one might argue that recalling events that occurred up to 12 months ago might not be relevant enough to lead to intense anger activation. In fact, the average time since the event was three to four months and an additional requirement was that recalling the event still elicited feelings of anger. Nevertheless, methods that directly activate anger in an interpersonal situation (e.g. Pfeiler *et al.*, 2017) might lead to a stronger anger activation, possess higher ecological validity (Lobbestael *et al.*, 2008), and offer opportunities to assess behavioural outcomes (e.g. participants' tendencies to approach or avoid the person who provoked the anger). Future studies should consider using a stronger, more direct anger induction and also include measures of anger before and after the induction to allow researchers to test the strength of the anger induction. Second, we cannot exclude the possibility that the relative complexity of the inductions of concrete versus abstract rumination – although implemented successfully in many previous studies (e.g. Rimes and Watkins, 2005; Watkins *et al.*, 2008; Watkins and Teasdale, 2001) – might have influenced our capacity to examine the consequences of the two modes of rumination. Therefore, future studies might develop and validate novel induction paradigms. Third, we investigated only the immediate effects of ruminative modes. Researchers have proposed that ruminative modes have different effects in the short term compared with the long term (e.g. Hart-Smith and Moulds, 2019). It is possible the rumination modes might exert their influence rather in the intermediate term, for example after one hour, and future studies should consider investigating their longer-term effects. Fourth, our sample was predominantly female, relatively young and culturally homogenous. The results therefore may not be generalizable to other populations, particularly as there is some indication that the tendency to ruminate about anger may differ by gender, age and culture (Maxwell *et al.*,

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2005; Ramos-Cejudo *et al*., 2017; Sukhodolsky *et al*., 2001). Fifth, the absence of a no-instruction control condition means that we cannot ascertain whether the observed time effects were merely due to recalling a past anger-eliciting event or to ruminating about it. The inclusion of an appropriate control in future studies will clarify this. Sixth, we did not include a measure that allowed us to estimate whether demand effects might have influenced the results – although we note that we employed instructions and manipulations used in previous rumination studies. Finally, our Phase 1 manipulation check scales' internal consistencies were below what may be considered acceptable values. Despite this limitation, our analysis using these scales yielded a medium-to-large effect and supported successful ruminative mode inductions. Future studies should assess possible demand effects, and researchers may consider replacing or modifying the manipulation check scales used in our study.

In conclusion, this study represents an initial investigation of the differential effects of abstract versus concrete rumination (as described by the processing-mode theory) about anger on current anger, negative affect, and positive affect. Our results suggest that these two ruminative modes do not have distinct consequences for anger. Future studies should investigate the differential effects of abstract versus concrete rumination about anger in a more extensive study design, which may include stronger and more ecologically valid anger inductions and longer-term assessments of the effects of ruminative modes – with the goal of extending the applicability of this laboratory research to everyday life situations. Such studies may yield important implications for treatments of rumination about anger. If they confirm our results, it may not be advisable to encourage individuals experiencing high levels of rumination about anger to shift to a more concrete thinking style, as might be useful in the areas of depression or anxiety (e.g. Topper *et al*., 2017; for a case study successfully applying such a treatment to an individual with problematic rumination about anger, see Moeller *et al*., 2021). To reduce anger, negative and positive affect, these individuals may instead be encouraged to use alternatives to rumination such as distraction, problem solving, or detached mindfulness (e.g. Teismann *et al*., 2014). Such treatments may find application as preventative programs (e.g. Teismann *et al*., 2014) or interventions for individuals with issues (e.g. intimate partner violence; Babcock and Potthoff, 2021) or mental disorders (e.g. intermittent explosive disorder or bipolar disorder; Fernandez and Johnson, 2016) that are related to anger or aggression.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S1352465823000280

Data availability statement. The data that support the findings of this study are available from the corresponding author, K.W., upon reasonable request.

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Author contribution. **Carlotta Heinzel:** Data curation (equal), Formal analysis (lead), Writing – original draft (lead); **Michelle Moulds:** Conceptualization (supporting), Methodology (supporting), Resources (supporting), Writing – review & editing (equal); **Martin Kollárik:** Data curation (equal), Formal analysis (supporting), Writing – review & editing (equal); **Roselind Lieb:** Conceptualization (equal), Funding acquisition (equal), Methodology (equal), Project administration (equal), Resources (equal), Supervision (equal), Writing – review & editing (equal); **Karina Wahl:** Conceptualization (equal), Formal analysis (supporting), Funding acquisition (equal), Methodology (equal), Project administration (equal), Resources (equal), Supervision (equal), Writing – review & editing (equal).

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Ethical standard. The study was approved by the Ethics Committee of the Department of Psychology at the University of Basel and conformed with the 1964 Helsinki Declaration and its later amendments.

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