Trait anger moderates the impact of anger-associated rumination on social well-being ☆

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ABSTRACT

In this study, we examined whether people's social well-being is influenced by hostile versus nonhostile goals that people report pursuing when experiencing anger-associated rumination. Moreover, we investigated the impact of trait anger and trait anger rumination on the relationship between anger rumination and perceived social well-being. Participants were 93 students who were equipped with hand-held computers for 28 days to assess anger-related rumination and its social consequences in daily life. Results showed that hostile goal pursuit *per se* did not affect perceived social well-being. However, impairment of social well-being following hostile rumination was moderated by trait anger. Findings are consistent with recent cognitive models of trait anger and anger rumination.

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1. Introduction

Ruminating about anger-evoking events has proven to be largely dysfunctional. Studies examining processes of rumination about real, recalled, or imagined anger incidents have demonstrated that rumination intensifies anger (Ray, Wilhelm, & Gross, 2008; Rusting & Nolen-Hoeksema, 1998; Weber & Wiedig-Allison, 2007), increases hostile behavior (Bushman, 2002; Bushman, Bonacci, Pedersen, Vasquez, & Miller, 2005), reduces forgiveness (McCullough, Bono, & Root, 2007) and delays blood pressure recovery (Glynn, Christenfeld, & Gerrin, 2002).

Similar findings have been documented for the habitual tendency to engage in anger rumination. Trait anger rumination was associated with lower subjective well-being (Kubiak, Wiedig-Allison, Zgoriecki, & Weber, 2011; Philips, Henry, Hosie, & Milne, 2006; Sukhodolsky, Golub, & Cromwell, 2001), aggressive behavior (Anestis, Anestis, Selby, & Joiner, 2009; Caprara, 1986; Sukhodolsky et al., 2001), and delayed blood pressure recovery (Gerin, Davidson, Christenfeld, Goyal, & Schwartz, 2006).

The impact of rumination on anger and aggressive behavior has recently been elaborated within the *Integrative Cognitive Model* (ICM) of trait anger and reactive aggression (Wilkowski & Robinson, 2008, 2010). According to this model, individuals with high trait anger are characterized by three cognitive processing tendencies that exacerbate anger and reactive aggression. Specifically, persons high

in trait anger are more biased toward interpreting situations as hostile; they are more likely to engage in ruminative attention that reinforces hostile biases and more likely to fail to exert effortful control that diminishes anger and reactive aggression.

Anger-associated rumination has typically been conceptualized as a focus on hostile interpretations and the harboring of hostile intentions, in particular, thoughts of revenge, which render the documented increase in anger and aggression following rumination particularly likely (Caprara, 1986; Sukhodolsky et al., 2001; Wilkowski & Robinson, 2008). However, previous research has not examined whether the consequences of anger rumination vary with the extent to which anger rumination is guided by hostile compared to nonhostile goals. Generally, the functionality of rumination varies with the style and content of rumination (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Segerstrom, Stanton, Alden, & Shortridge, 2003; Watkins, 2008). For example, thinking about anger episodes from a self-distanced perspective was more effective than re-experiencing episodes from a self-immersed perspective (Ayduk & Kross, 2008).

In the present study, we employed a daily experience approach to examine whether rumination about anger incidents that is motivated by the goal of taking revenge is more dysfunctional than rumination that focuses on nonhostile goals. Moreover, we explored whether trait anger and trait anger rumination moderate the inclination toward hostile versus nonhostile rumination and its impact on social well-being.

1.1. Present research

The present study was guided by three major aims. First, we examined whether the goals that people pursue with their

rumination following anger incidents influence social well-being, as indicated by the involvement and satisfaction with interpersonal interactions, and perceived social support. Based on the assumption that rumination may be motivated by hostile as well as nonhostile goals such as solving problems and gaining insight (Nolen-Hoeksema et al., 2008; Segerstrom et al., 2003), we were particularly interested in whether hostile goals are more detrimental to perceived well-being than nonhostile goals. In accordance with previous research that shows that hostile rumination increases the tendency for aggression (Wilkowski & Robinson, 2008, 2010) and hinders processes of forgiveness (McCullough et al., 2007), we expected hostile, but not nonhostile rumination to impair social well-being.

Previous studies on the social consequences of anger rumination have focused on the interaction between the ruminating person and the anger-instigating person (Caprara, 1986; McCullough, Bellah, Kilpatrick, & Johnson, 2001). Yet the social implications of rumination may likely extend to interpersonal interactions beyond the interaction with the instigator. This would follow from the cognitive-neoassociationistic theory of Berkowitz (1990), according to which the negative affect caused by aversive experiences automatically activates associated negative feelings, thoughts, and memories. In this view, anger and ruminative attention likely reinforce a negative bias in perceiving interpersonal interactions. Accordingly, we expected anger rumination – in particular, when motivated by hostile goals – to be associated with impairment in perceived well-being.

The second major aim of the present study was to examine the influence of trait anger and trait anger rumination. In accordance with the ICM (Wilkowski & Robinson, 2008, 2010), we expected individuals high in trait anger to be more likely to engage in hostile rumination than individuals low in trait anger. Moreover, we hypothesized that impairment in social well-being following hostile rumination would be higher for high trait anger individuals than low trait anger individuals. In addition, we explored whether trait anger rumination would predict a higher inclination for hostile rumination and a greater impairment to social well-being.

Finally, using a daily experience approach, we investigated anger-associated rumination as it is experienced in daily life. As part of a larger project, participants reported on rumination elicited by the experiences of anger for a period of 4 weeks. Such an in-field assessment offers the possibility of monitoring rumination close to the time of the actual experience, reducing retrospective biases that likely compromise generalized reports of rumination (Fahrenberg, Myrtek, Pawlik, & Perrez, 2007; Schwarz, 2007).

Moreover, this approach allowed us to assess process variables (including the duration, intensity, and perceived uncontrollability of rumination) and to explore whether they were related to hostile versus nonhostile goals, changes in social well-being, and the trait variables. Whereas we did not expect duration and intensity of rumination to differ between hostile and nonhostile rumination because both can be experienced as intense and lasting, we hypothesized that perceived uncontrollability would reflect a lack of cognitive control that might be higher for hostile rumination and high trait anger individuals (Wilkowski & Robinson, 2008, 2010).

2. Method

2.1. Participants

Participants were 93 students (nonpsychology; 64.5% women; mean age 23.4 years, $SD = 2.9$) at the University of Greifswald who took part in a larger study on rumination in daily life (Kubiak, Jonas, & Weber, submitted for publication). Students received 40 Euro for participation depending on their degree of compliance during the 4 weeks.

2.2. Electronic diary protocol

Participants were equipped with iPaq 114 series hand-held computers (Hewlett–Packard Corporation, Palo Alto, CA, USA) for 28 consecutive days. The experience sampling procedure was implemented using mQuest data entry software (cluetec GmbH, Karlsruhe, Germany). The participants were prompted acoustically four times per day to complete the questionnaire implemented on the hand-held computer (random time windows of ±30 min around 9 a.m., 1 p.m., 5 p.m., and 9 p.m.). For every trial, the participants were prompted to complete questions on the experience of specific emotions since the last trial (see Fig. 1).

2.2.1. Emotions

Participants were asked to report the possible experience (assessed dichotomously: yes/no) of six emotions: *anger, fear, sadness, joy, pride*, and *enthusiasm*. In cases in which more than one emotion was present, the participants were instructed to check the predominant emotion. The present study focused on anger.

2.2.2. Ruminative thinking

Participants were then asked if they ruminated in reaction to the instigating situation by a single item ("I cannot forget the situation and keep thinking about it") from the anger-related reactions and goals inventory (ARGI; Kubiak, Wiedig-Allison, et al., 2011) that was rated on a 9-point Likert scale from 1 (*totally disagree*) to 9 (*totally agree*). If participants indicated that they reacted with rumination (score > 1), they were prompted to report its *content* focus (forced choice between oneself vs. someone else vs. eliciting event). Then the participants rated the *intensity* of their rumination, and its *perceived uncontrollability* ("How difficult is it for you to stop thinking about the event?"). Both features were assessed on 9-point Likert scales ranging from 1 to 9. Aggregate reliabilities were computed as suggested by Snijders and Bosker (1999) and had $\lambda > .97$ for both items.

Next, participants were asked to check the extent to which they pursued each of nine *goals* with their rumination, including five *explanation-focused goals* that revolve around understanding the causes of the emotion-eliciting event and one's feelings (e.g., "I want to understand why that happened"), three *solution-focused goals* (e.g., "I want to find out how I can come to terms with this situation"), and the *revenge-focused goal* ("I want to find out how I can get back at the other person"). Each goal was assessed by a single item, scaled from 1 (*totally disagree*) to 9 (*totally agree*; all aggregate reliabilities $\lambda > .99$; revenge $\lambda = .98$). For further analyzes, we aggregated the five explanation-focused and the three solution-focused goals, yielding an index for explanation-focused and solution-focused goal pursuit.

2.2.3. Ruminative thinking loops

If participants indicated that they ruminated in reaction to the instigating situation, questions concerning the intensity and perceived uncontrollability of rumination were repeatedly presented on the hand-held computer on an hourly basis. This loop was repeated until the participants indicated that they had stopped ruminating. When rumination was terminated, participants were asked about: (a) goal attainment and (b) indicators of social well-being.

(a) *Goal attainment* was measured for each of the nine goals presented at the initial measurement by asking whether this goal had been achieved through rumination (scaled dichotomously: attained vs. not attained), yielding three goal attainment indices for: (a) the explanation-focused goals, (b) the problem-focused goals, and (c) the revenge-focused goal.