

The Effects of Analytical Rumination, Reappraisal, and Distraction on Anger Experience

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The manner in which individuals recall negative life events has important affective consequences. The present experiment investigated the effects of emotion regulation strategies on anger experience. One hundred and twenty-one undergraduates recalled an anger-inducing memory and were instructed to engage in either analytical rumination, cognitive reappraisal, or distraction for 20 minutes. In the remaining (control) condition, participants were instructed to write about their thoughts but were not given any emotion regulation instructions. Rumination maintained anger, whereas participants in the remaining conditions reported decreased anger following the writing task. Our results suggest that reappraisal facilitates adaptive processing of anger-inducing memories and distraction facilitates rapid reductions in anger experience. These findings have implications for the management of clinical populations that commonly experience difficulty with anger regulation.

Keywords: anger; reappraisal; distraction; rumination

WHEN REMEMBERING AN ANGER-ELICITING event, an individual may engage in a range of potential cognitive processes. These processes determine

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whether recalling the event reinstates, attenuates, maintains, or amplifies the feelings of anger that were experienced at the time that it occurred. In the current experiment, we examined whether three distinct emotion regulation strategies—rumination, reappraisal, and distraction—differentially influence the degree to which angry feelings are activated when anger-eliciting events are recalled.

At its broadest, *rumination* refers to a type of perseverative cognition that has been characterized as “the experience of having repetitive, intrusive, negative cognitions” (Brosschot, Gerin, & Thayer, 2006, p. 114; for reviews see Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Watkins, 2008). Rumination has been studied extensively in the context of depression. The relationship between rumination and anger has received relatively less empirical attention, although interest in this area has grown in recent years. Angry rumination involves focusing on anger-inducing memories, reexperiencing anger responses, and thoughts of revenge (Caprara, 1986; Denson, Pedersen, & Miller, 2006; Sukhodolsky, Golub, & Cromwell, 2001). Rusting and Nolen-Hoeksema (1998) found that ruminating about an anger-inducing event exacerbated anger, whereas distraction decreased it. Angry rumination also increases aggression over extended periods, even toward undeserving individuals (Bushman, 2002; Bushman, Bonacci, Pedersen, Vasquez, & Miller, 2005). Moreover, chronic angry rumination is related to frequent anger experience, reduced life satisfaction, self-reported domestic abuse, road rage, and other forms of aggression (Anestis, Anestis, Selby, & Joiner, 2009; Caprara, 1986; Collins & Bell, 1997; Denson et al., 2006; Martin & Dahlen, 2005; Sukhodolsky et al., 2001).

Within the anger literature, researchers have increasingly specified subtypes of rumination that can result in different affective and behavioral consequences. For instance, focusing on an interpersonal provocation and the associated feelings of anger (termed “provocation-focused rumination”) rather than focusing on the identical event with a self-critical, inward focus (termed “self-focused rumination”; e.g., “Why do I always react this way?”) produces unique cognitive, affective, and physiological responses (Denson, Fabiansson, Creswell, & Pedersen, 2009; Pedersen et al., 2011). Similarly, in the context of depression, researchers have differentiated subtypes of rumination. However, rather than a distinction between subtypes based on the *content* of rumination, recent developments in the depression field have emphasised the distinctive consequences of adopting different modes of *processing* (i.e., analytical vs. experiential) during rumination. This work has highlighted that while thinking in an analytical and abstract way during rumination (i.e., thinking about the causes, meanings, and consequences of one's current state) has maladaptive consequences, thinking about the same content in a more concrete, experiential manner (i.e., focusing directly on how one feels, without analyzing the causes, meanings, and consequences) is beneficial (e.g., Watkins, 2008; Watkins, Moberly, & Moulds, 2008; Watkins & Moulds, 2005).

Recent studies in the anger literature have further distinguished between analytical rumination that is conducted in either an emotionally immersive manner or in a distanced, detached manner. Specifically, when analytical rumination is conducted in a “hot” (i.e., emotionally immersive) manner it tends to result in higher levels of anger than a “cool” (i.e., distanced perspective; Ayduk & Kross, 2008; Kross, Ayduk, & Mischel, 2005). In the present research, we induced analytical rumination and subsequently determined whether it was effective in reducing anger when individuals adopted a hot versus cool perspective.

In contrast to rumination, a substantial body of research suggests that *cognitive reappraisal* may be an adaptive way to manage negative emotional experiences (Gross, 2002). Cognitive reappraisal involves mentally modifying the way that a situation is evaluated prior to the elicitation of a full-scale emotional response. Lazarus and colleagues' influential theories of stress and coping emphasized the effects of appraisal and reappraisal processes in determining and reducing anger, respectively (Lazarus, 1991; Lazarus & Folkman, 1984). Similarly, the general aggression model (Anderson & Bushman, 2002) emphasizes that when sufficient

cognitive resources are available, reappraisal can reduce the likelihood of aggressive behavior, which is the end result of action tendencies commonly associated with anger (Averill, 1982; Frijda, 1986). Therapeutic interventions also recognize the role of reappraisal in anger management. For example, Novaco's (1977) stress inoculation anger-reduction program includes reappraisal as a key component of effective anger reduction. Furthermore, a recent meta-analysis of anger treatments reported a moderate reduction in anger for programs that utilized cognitive restructuring ($d=0.51$; DiGiuseppe & Tafrate, 2003). Given that the primary goal of cognitive therapy is to encourage patients to adopt alternative, more balanced interpretations of themselves and the world in order to modulate their emotional responses (consistent with the objective of reappraisal), this meta-analysis highlights the utility of reappraising anger-inducing situations as a means to reduce anger.

Individual differences in positive reappraisal are related to lower levels of trait anger as well as depression, anxiety, and stress (Martin & Dahlen, 2005; Memedovic, Grisham, Denson, & Moulds, 2010). Mauss, Cook, Cheng, and Gross (2007) found that participants who were high in trait reappraisal reported less anger and a more adaptive cardiovascular challenge response to an interpersonal provocation relative to participants low in trait reappraisal, who showed a less beneficial cardiovascular threat response. Similarly, we found that high levels of trait reappraisal were associated with attenuated anger and blood pressure reactivity following provocation (Memedovic et al., 2010). In another experiment, undergraduates were randomly assigned to recall an anger-eliciting event, and then instructed to either ruminate or reappraise the episode (Ray, Wilhelm, & Gross, 2008). Participants who reappraised responded with less anger and sympathetic nervous system activity than participants who ruminated. To our knowledge, the study by Ray et al. is the only one that has experimentally investigated the relative consequences of rumination and reappraisal on anger experience.

Researchers frequently compare the impact of rumination to that of *distraction*, an alternate emotion regulation strategy that involves attentional focus on external stimuli. Indeed, thinking about a neutral topic unrelated to the anger-inducing event is the antithesis of ruminating about it. However, as noted by Ray et al. (2008), the use of a condition that involves the active direction of attention toward external stimuli does not clarify whether the aversive impact of rumination is a function of

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