



The effect of emotion regulation strategies on anger[☆]

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ABSTRACT

This study examined the effects of different emotion regulation strategies on the experience and expression of anger. Participants consisted of undergraduate students who endorsed at least a moderate level of state anger. As part of a laboratory experiment, they were instructed to reappraise ($n = 24$), suppress ($n = 24$), or accept ($n = 25$) their anger during a frustrating task. Reappraisal was more effective at reducing anger than attempts to suppress or accept it. Furthermore, participants in the reappraisal condition persisted significantly longer with the frustrating task than those who were instructed to suppress or accept their negative feelings. These findings suggest that reappraisal techniques are more effective than acceptance and suppression techniques for modulating the experience and expression of anger.

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The effects of emotion regulation strategies on anger

Being able to regulate one's emotions is adaptive and promotes psychological well-being, especially when dealing with anger and distress (Mauss, Cook, Cheng, & Gross, 2007). Emotion regulation consists of processes through which individuals modulate their emotions in an automatic and effortless and/or conscious and effortful manner (Bargh & Williams, 2007; Campbell-Sills & Barlow, 2007), and try to influence the occurrence, intensity, duration, and expression of those emotions to appropriately respond to environmental demands (Campbell-Sills & Barlow, 2007; Gross, 1998). Effective emotion regulation is associated with good health outcomes, and improved relationships and academic work performance (Brackett & Salovey, 2004; John & Gross, 2004), whereas difficulties with emotion regulation are associated with greater distress that may be associated with emotional disorders and other illnesses (Berenbaum, Raghavan, Le Vernon, & Gomez, 2003; Greenberg, 2002; Gross & Levenson, 1997; Mennin & Farach, 2007; Mennin, Holoway, Fresco, Moore, & Heimberg, 2007; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008).

The most commonly researched emotion regulation strategies include suppression and cognitive reappraisal. A direct comparison between these strategies suggests that reappraisal is more effective at regulating negative emotions, whereas suppression is associated with counterproductive effects that lead to experiences of elevated levels of physiological arousal and negative affective consequences (Gross, 1998; Hofmann, Heering, Sawyer, & Asnaani, 2009; Richard & Gross, 2000; Wegner & Gold, 1995; Wegner & Zanakos, 1994).

More recently, investigators have also examined the effects of acceptance strategies to regulate emotions (Eifert & Heffner, 2003; Najmi, Riemann, & Wegner, 2009). Whereas some authors view this approach as being significantly different from conventional CBT, others have taken a more critical stance (e.g., Hofmann & Asmundson, 2008). Acceptance is an important feature of Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) and defined as "the active and aware embrace of private events occasioned by one's history without unnecessary attempts to change their frequency or form, especially when doing so cause psychological harm" (Hayes, Luoma, Bond, Masuda, & Lillis, 2006, p. 14).

Studies have shown that acceptance strategies are more effective than suppression in moderating subjective distress in patients with panic attacks (Eifert & Heffner, 2003; Levitt, Brown, Orsillo, & Barlow, 2004). For example, participants who are exposed to 10% CO₂ enriched air report less fear and less catastrophic thoughts when asked to use acceptance strategies than when instructed to control their symptoms using diaphragmatic breathing techniques or no instructions (Eifert & Heffner, 2003).

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It has further been shown that participants with anxiety and mood disorders generally judge their negative emotions in response to a distressing film as less acceptable and tend to suppress their emotions to a greater extent than nonanxious participants (Campbell-Sills, Barlow, Brown, & Hofmann, 2006a). However, when instructed to use acceptance strategies, individuals with clinical diagnoses of anxiety or depression report less subjective distress and lower autonomic arousal than when asked to suppress their emotions in response to a distressing film (Campbell-Sills, Barlow, Brown, & Hofmann, 2006b).

Similar effects have also been shown in healthy individuals using a social stress task (Hofmann et al., 2009). In this study, participants were randomly assigned to reappraise, suppress, or accept their anticipatory anxiety prior to an impromptu speech. The instructions to suppress anxiety were associated with greater increase in physiological arousal than the instructions to reappraise and accept. Furthermore, the suppression group reported more subjective anxiety than the reappraisal group. However, the acceptance and suppression groups did not differ in their subjective anxiety response. These findings suggest that both reappraising and accepting anxiety is more effective for moderating the physiological arousal than suppressing anxiety, but reappraising is more effective for moderating the subjective feeling of anxiety than attempts to suppress or accept it. This study showed that cognitive reappraisal of the emotional response to an impromptu speech is more effective at moderating subjective distress and autonomic arousal than attempts to accept or suppress the response.

The majority of studies on emotion regulation have examined the regulation of anxious arousal or emotional distress. In contrast, relatively few studies have focused on the regulation of anger, despite its central importance in human interactions (e.g., Baumeister, Stillwell, & Wotman, 1990; DiGiuseppe & Froh, 2002). Consistent with the anxiety literature, trait reappraisal moderates state anger in a situation of anger provocation (Mauss et al., 2007). In this study, individuals who were low or high in cognitive reappraisal were made angry in the laboratory using an experimental anger induction (Stemmler, 1997). Results indicated that, compared with low reappraisers, high reappraisers reported less anger, less negative emotion, and more positive emotion, and exhibited adaptive physiological responses.

Another study compared the effects of induced anger rumination and anger reappraisal on anger after recalling an anger-inducing autobiographical event (Ray, Wilhelm, & Gross, 2008). The results showed that participants who were instructed to ruminate reported greater anger, more cognitive perseveration, and greater sympathetic nervous system activation than participants who reappraised their anger experience. Similar findings were reported in a study that examined the effects of cognitive reappraisal and expressive suppression on self-reported anger and blood pressure during anger provocation (Memedovic, Grisham, Denson, & Moulds, 2010). Participants high in trait reappraisal showed attenuated anger and blood pressure in response to anger provocation.

Recently, it has been suggested that people may choose to increase their anger when anticipating a confrontation task despite experiencing short-term hedonic costs (Tamir, Mitchell, & Gross, 2008). This experiment has shown that angry participants perform better than controls in a violent video game by successfully killing more enemies. This suggests that, depending on the context, functional levels of anger can help individuals achieve their goals. In contrast to Tamir et al.'s experiment, however, the present study focused on dysfunctional anger that is elicited by recalling personal situations in which participants experienced anger toward another person.

Previous studies have found that low frustration tolerance is associated with state and trait anger (Dryden, 2002; Jones & Trower, 2004; Martin & Dahlen, 2004). Frustration tolerance as a behavioral

measure in combination with self-report measures can be used to gain information about the interaction between frustration-intolerant cognitions and distress-intolerant behaviors (Rodman, Daughters, & Lejuez, 2009). Based on this literature, it can be assumed that longer persistence on difficult tasks is associated with higher levels of frustration tolerance, and lower levels of anger.

In sum, the results of these studies suggest that cognitive reappraisal is a more effective strategy for regulating anger than suppression and rumination strategies. More recently, proponents of ACT (Hayes et al., 1999) have argued that acceptance-based regulation would provide an even more effective alternative for regulating negative mood states, including anger (Eifert & Heffner, 2003). However, no study has directly compared the effects of acceptance, cognitive reappraisal, and suppression on anger. Therefore, the goal of the present study was to investigate the differential effects of the strategies on state anger at the subjective and behavioral level. Based on previous studies, we predicted that suppression is associated with the most anger experience and the least level of frustration tolerance during a frustrating task. The traditional cognitive model (e.g., Beck, 1976; Ellis, 1962) predicts that cognitive reappraisal is associated with the least anger experience and a high level of frustration tolerance (longer task persistence). In contrast, the more recent ACT model (Hayes et al., 2006) predicts that acceptance is associated with the least anger experience and a high level of frustration tolerance (longer task persistence).

Method

Participants

Participants included 97 undergraduate students (61.9% female) from computer science, mathematics, sociology, and psychology classes at Babes-Bolyai University. They received course credit for participating in this study. All participants completed the anger induction procedure. In order to be able to study the effects of the instruction manipulation on anger, only those participants were included in the final analysis if they endorsed at least a moderate level of state anger based on their state anger ratings after a frustrating task ($n = 73$). A moderate level of anger was defined as a score of 3 on a scale ranging from 1 (not present) to 5 (very much) points using a composite score that included items (angry, mad, and irritated) derived from the negative emotion subscale of the Profile of Affective Distress (PAD). Participants' age ranged from 19 to 38 (mean age 22.30, $SD = 4.27$). Informed consent was obtained from each participant.

Self-report measures

Profile of affective distress (PAD)

This measure was used to assess affective states using a scale of positive and negative emotions on a 5-point Likert scale ranging from 1 to 5 (1 = not present, 5 = very much; Opris & Macavei, 2007). The PAD is a 39-item scale that measures negative and positive emotions. The scale has high internal consistency (Cronbach's $\alpha = .94$). Three items from the negative emotions subscale were used to assess state anger (angry, mad, and irritated).

Affective style questionnaire (ASQ)

The ASQ (Hofmann & Kashdan, 2010) is a 20-item instrument that measures individual differences in emotion regulation. The questionnaire consists of three subscales: *Concealing* (referring to habitual attempts to conceal or suppress affect), *Adjusting* (a general ability to manage, adjust, and work with emotions as needed), and *Tolerating* (an accepting and tolerant attitude toward emotion). We

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