

Effects of the Simultaneous Use of Acceptance and Cognitive Reappraisal on Anger, Positive and Negative Affect after Experimental Anger Elicitation*

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A significant body of research has focused on the effectiveness of a single primary emotion regulation strategy on subjective experience. However, in everyday life people often use more than one strategy to regulate the aroused emotions. The present study used a mixed-design to explore the effects of two emotion regulation strategies (reappraisal and acceptance) and of two co-activated emotion regulation strategies (acceptance and reappraisal, and reappraisal and acceptance) on the subjective experience of anger, positive and negative affect after experimental anger elicitation. After participants ($N = 99$; $X_{age} = 25.41$ years; $SD = 8.81$ years) recalled a recent anger unsolved event, they were instructed to either (1) reappraise the event, (2) accept the emotions elicited by the event, (3) accept the emotions and reappraise the event; (4) reappraise the event and accept their elicited emotions, or (5) to deal with their emotions as usual (control group). The results show that all emotion regulation instructions lead to a lower level of post-instructions anger intensity and negative affect. In terms of positive affect, only the instruction of simultaneous use of acceptance and reappraisal leads to a higher level of post-instructions positive emotions. The results showed no significant differences between cognitive reappraisal, acceptance, simultaneous use of acceptance and cognitive reappraisal, simultaneous use of reappraisal and acceptance, and control group on post-instruction anger level, post-instruction positive affect, post-instruction negative affect.

Keywords: reappraisal, acceptance, anger, simultaneous use of emotion regulation strategies, positive and negative emotions, multiple strategy use

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Highlights

- Cognitive reappraisal and acceptance are among the most commonly used emotion regulation strategies.
- People may use various emotion regulation strategies simultaneously or sequentially.
- All emotion regulation instructions led to a lower level of post-instructions anger intensity and negative affect.
- Only the simultaneous use of acceptance and reappraisal led to a higher level of post-instructions positive emotions.

Adaptively regulating emotions promotes psychological well-being (Gross & John, 2003; Ursu & Măirean, 2022). Emotion regulation consists of “the extrinsic and intrinsic processes responsible for monitoring, evaluating and modifying our emotional reactions, especially their intensive and temporal features, to accomplish one’s goals” (Thompson, 1994, pp. 27-28). Over the past twenty years, a significant body of research has been dedicated to comprehending the impact of emotion regulation on individuals’ overall well-being, as well as the correlations between distinct emotion regulation strategies and mental health. The literature indicates that adaptive emotion regulation strategies, including cognitive reappraisal, actively approaching, positive refocus, positive reappraisal, seeking social support and acceptance, have been found to exhibit negative correlations with psychological problems, such as depressive symptoms, anxiety, and stress (Carvajal et al., 2020; Garnefski & Kraaij, 2006; Gross & John, 2003; Jurado et al., 2021; Kraaij & Garnefski, 2019). Regarding the relationship between maladaptive emotion regulation strategies and mental health problems, existing evidence indicates a positive association. The use of maladaptive strategies, including rumination, withdrawal, catastrophizing, and ignoring, has been found to be linked to adverse consequences such as high levels of anxiety, stress, depression, and insomnia (Dubey et al., 2020; Jurado et al., 2021; Kraaij & Garnefski, 2019; Ursu & Măirean, 2022).

Another important line of research concerns the comparisons of different emotion regulation strategies’ effects on subjective experience using experimental or quasi-experimental designs. Some of the most widely used emotion regulation strategies are cognitive reappraisal and acceptance. Cognitive reappraisal consists of giving another meaning to the emotional event in order to change one’s emotional experience (Gross, 1998). Cognitive reappraisal is an important component of Cognitive-Behavioral Therapy (CBT, Beck, 2005). The results of studies where participants were instructed to use cognitive reappraisal consistently highlight the positive effects on psychological health. For example, it has been shown that using cognitive reappraisal leads to lower physiological arousal, lower anxiety, lower anger, and lower disgust as compared to other strategies such as suppression, acceptance or to control groups, where participants were not given specific instructions on how to regulate their emotions (Hofmann et al., 2011; Szasz et al., 2011; Wolgast et al., 2011). Additionally, the results of the meta-analysis conducted by Webb and

colleagues (2012) support the same pattern of results. Reappraisal was found to be efficient in decreasing negative emotions and increasing positive emotions across studies using experimental approaches.

Acceptance refers to the individual's openness to internal experience and the desire to stay in touch with that experience without trying to change, control, or avoid it (Hayes et al., 1999). Acceptance is an important component of Acceptance and Commitment Therapy (ACT, Hayes et al., 2006). The concept of acceptance is believed to enable individuals to experience the complete spectrum of human emotions in a nonjudgmental manner, so facilitating the development of enhanced self-awareness, self-compassion, and behavioral flexibility (Hayes & Wilson, 2003; Kashdan et al., 2006). The results on this emotion regulation strategy are mixed. More precisely, previous studies showed that acceptance is less efficient than cognitive reappraisal in decreasing anger, sadness, anxiety, and disgust and in increasing positive emotions (Hofmann et al., 2011; Szasz et al., 2011; Troy et al., 2018; Wolgast et al., 2011), while the results of other studies suggested no significant differences between acceptance and other emotion regulation strategies such as reappraisal in decreasing subjective distress, sadness or fear (Asnaani et al., 2013; Wolgast et al., 2011). Additionally, the results of one study showed that acceptance led to more positive emotions and stronger expressivity compared to other strategies such as suppression (Dan-Glauser & Gross, 2015). In a recent study, it was found that both acceptance and reappraisal compared to reacting led to lower levels of self-reported negative emotions (Goldin et al., 2019). However, when compared to each other, the results showed that reappraisal was more efficient compared to acceptance in decreasing negative emotions after reading negative self-beliefs. Another recent laboratory-based study found that detachment, a form of cognitive reappraisal where participants are instructed to take the third-person perspective, was the most efficient in decreasing sadness, anger, and disgust compared to positive reappraisal and acceptance among healthy seniors, while detachment and positive reappraisal were more efficient in decreasing fear than acceptance (Rompilla et al., 2022). In terms of positive affect, the results of the same study showed that positive reappraisal was more efficient in increasing happiness, and no difference was found between detachment and acceptance. These results are consistent with the results of one meta-analysis showed that there is no difference between acceptance and suppression, distraction, or reappraisal for negative affect (Kohl et al., 2012). However, when it comes to pain tolerance, the results indeed showed that acceptance is superior to suppression, distraction, or reappraisal.

Scholars have suggested that individuals may engage in the utilization of numerous emotion regulation strategies simultaneously or sequentially (Aldao & Nolen-Hoeksema, 2013; Gross, 2015; John & Gross, 2007). Furthermore, it has been proposed that the effectiveness of specific emotion regulation strategies may vary depending on the level of arousal associated with the emotion in question. For example, previous research has indicated that individuals tend to employ reappraisal as a regulatory strategy while experiencing low-intensity emotions, and when emotions are highly intense, individuals tend to favor other strategies from the attentional deployment group (Gross, 2015). Moreover, it was shown that reappraisal is associated with a higher cognitive burden (Sheppes & Gross, 2011), while acceptance is

associated with a lower cognitive burden (Keng et al., 2013). These findings have led researchers to propose a new concept called polyregulation. Polyregulation refers to spontaneously using more than one strategy to regulate a single emotion episode (Ford et al., 2019). In their paper, the authors suggested the need to test the effectiveness of using two emotion regulation strategies simultaneously rather than a single strategy in experimental contexts. Nevertheless, despite the suggestion that individuals may utilize multiple strategies for regulating their emotions sequentially or simultaneously, few empirical studies have explored this new avenue of research. To the best of our knowledge, four studies where the effects of co-using two different emotion regulation strategies on subjective experience or interpersonal problem-solving were conducted. More precisely, one study analyzed the sequential effects of rumination and distraction after inducing depressed mood (Trask & Sigmon, 1999). It was found that the initial use of rumination was associated with the persistence of depressive mood, while the initial use of distraction was linked to a reduction in depressive mood. Additionally, a significant impact of strategy order was observed, whereby subjects who engaged in distraction following rumination reported a lower level of depressive mood. After engaging in rumination following the distraction, the participants did not report any change in their emotional state. The second study also analyzed the sequential effects of rumination and distraction after inducing sadness on negative mood and interpersonal problem solving (Yoon & Joormann, 2012). They found that participants who first engaged in distraction followed by rumination or distraction proposed more effective solutions to interpersonal problems and a higher percentage of solutions similar to the proposed model compared to the groups who first engaged in rumination followed by distraction or rumination. In terms of negative mood, participants who initially used rumination followed by distraction reported a higher level of negative mood compared to the participants who initially distracted themselves and ruminated afterward. In a recent study, Peuters and colleagues (2019) aimed to investigate the sequential effects of reappraisal and rumination on anger experience after recalling an anger-provoking event. The results showed the initial use of rumination followed by reappraisal led to a greater reduction in anger across time compared to the initial use of reappraisal followed by rumination. These results highlight the importance of the initial emotion regulation strategy. All these three studies assessed the sequential effects of two emotion regulation strategies on subjective experience or interpersonal problem-solving. However, a more recent study analyzed the simultaneous effects of situation selection and emotional suppression on subjective experience, expressivity, and physiological arousal (Thuillard & Dan-Glauser, 2020). They found that when used simultaneously, emotional suppression lowered the beneficial effects of situation selection on negative experience, while using both strategies led to better cardiovascular regulation. Finally, three out of four studies examined the sequential effects of one maladaptive emotion regulation strategy (rumination) and more adaptive strategies (distraction, reappraisal) on depressive mood (Trask & Sigmon, 1999), on negative mood and interpersonal problem-solving (Yoon & Joormann, 2012) and on anger experience (Peuters et al., 2019), while one study examined the simultaneous effect of one adaptive emotion regulation strategy (situation selection) and a maladaptive emotion regulation strategy (emotional suppression) on experience, expressivity and physiological arousal (Thuillard & Dan-Glauser, 2020).

Additional support for choosing to test the simultaneous effect of acceptance and reappraisal comes from the theory proposed by Shallcross and colleagues (2015), suggesting that using initially acceptance might facilitate reappraisal success, which may lead to resilience. Acceptance encompasses two distinct sub-processes, namely attention to one's current state and nonjudgment. These acceptance's components may have the potential to enhance the effectiveness of reappraisal. Initially, directing one's attention toward their current state fosters an expanded perception of many stimuli, including one's emotions, thoughts, and bodily sensations. The process of effectively reinterpreting one's thoughts may be facilitated by cultivating an initial awareness of one's cognitive and emotional states. Furthermore, nonjudgment can be defined as the act of evaluating one's feelings, especially those that are negative, as experiences that are not threatening and temporary occurrences, rather than as reflections of a permanent reality (Hayes & Wilson, 2003). Based on synthesized theories and empirical studies' results, we aim to extend the body of work related to polyregulation or the simultaneous use of two emotion regulation strategies by assessing the effects of two adaptive emotion regulation strategies: acceptance and reappraisal on anger, a high-arousal and frequently experienced emotion in daily life.

The Present Study

In sum, the results of previous studies suggest (a) mixed results on acceptance effectiveness on subjective experience, (b) no study tested the simultaneous effects of two adaptive emotion regulation strategies after anger recall on subjective experience even though this need had previously been suggested (Peuters et al., 2019), and (c) no study tested the theory on the complementarity of acceptance and reappraisal (Shallcross et al., 2015). Therefore, the main aim of the present study was to investigate the simultaneous effects of two emotion regulation strategies after experimental anger elicitation on subjective experience of anger, on negative and positive affect. Based on previous studies, we expected that all emotion regulation instructions (reappraisal, acceptance, co-activation of acceptance and reappraisal and co-activation of reappraisal and acceptance) would decrease anger level and negative affect and increase positive affect. Additionally, based on Shallcross and colleagues' theory (2015), we expected that the co-activation of acceptance and reappraisal group would experience a lower level of anger state and negative affect and higher level of positive affect compared with all other groups (reappraisal, acceptance, and co-activation of reappraisal and acceptance and control group). We thus assessed the specific combined effects of two different emotion regulation strategies on subjective experience and we investigated the simultaneous effects of two emotion regulation strategies compared to each other strategy. Furthermore, based on Troy and colleagues' results (2018) we tested whether there are differences in perceived effort, difficulty, success, and proposing a win-win solution depending on emotion regulation conditions. Finally, based on Kalokerios and colleagues' study (2018) we tested whether there are differences in other responsibility, self-responsibility, ongoing situation, and situation's importance.

This study has several methodological strengths such as (a) comparing the effects of two adaptive emotion regulation strategies, reappraisal, acceptance, and simultaneous use of acceptance and reappraisal and simultaneous use of reappraisal

and acceptance to each other but also to a control group “regulate as usual”; (b) examining emotion regulation and simultaneous use of emotion regulation strategies in response to an autobiographical recall, which is a more ecologically valid strategy for eliciting real-life emotions; (c) assessing the emotion regulation effects on specific emotions such as anger, but also on positive and negative affect using both within- and between-designs, as it was previously suggested by Wolgast and colleagues (2011); (d) assessing the simultaneous effects of two adaptive emotion regulation strategies; (e) assessing the effects of emotion regulation strategies on process questions such as perceived effort, perceived success, perceived difficulty and motivation to solve the conflict and on appraisals concerning the anger event elicitation such as other responsibility, self-responsibility, ongoing situation and situation’s importance.

Method

Participants

The initial sample consisted of 284 undergraduate students from Educational Sciences and Psychology classes at Ștefan cel Mare, University of Suceava, Romania. All participants received extra course credit. Four participants were eliminated because they declined the participation invitation. All other participants completed the anger induction procedure. Because the aim of this study was to analyze the effects of emotion regulation instruction on positive and negative affect after an anger induction procedure, only participants which reported at least a moderate level of state negative negative, based on their state negative affect evaluation after anger induction were included in the analysis. In this study, a moderate level of negative affect was defined as the mean of the two negative emotions items derived from PANAS-short form ($M = 1.98$, $SD = .85$). Twenty-two additional participants were eliminated because they reported a level lower than 4 (the moderate score based on the scale from 0 – not at all to 8 – very much) on the perceived effort to use the instructions during the regulation period and the responses of eight additional participants were not included in the analyses because they reported a level lower than 4, (considered the moderate score based on the scale from 0 – not at all to 8 – very much) on the perceived success in implementing the instructions. Thus, the final sample for this study consists of 99 participants (96% females) with an average age of 25.41 years ($SD = 8.81$, range 18-65). This sample size provided the main analyses with sufficient statistical power (.90), to detect a small group difference (effect size: .15, at $p < .05$).

Measures

Trait Anger

A Romanian validated version of trait anger subscale (Goldberg et al., 2006; Iliescu et al., 2015) was used to measure participants’ trait anger. This scale consists of 10 items, five of which are reverse-scored, evaluated on a 5-point Likert scale, from 1 (totally disagree) to 5 (totally agree). Total scores are computed by averaging the responses to each item. Higher scores indicate a high level of trait anger. In this study, the Cronbach’s alpha coefficient was .83.

Stress

The perceived stress was measured using a Romanian version of the short-Perceived Stress Scale (PSS; Cohen et al., 1994). This scale consists of 4 self-report items assessed on a 5-point Likert-type scale, ranging from 0 (never) to 4 (very often). Total scores are computed by averaging the responses to each item. A high score indicates a high level of perceived stress. The Cronbach's alpha coefficient of PSS was .80.

Positive and Negative Affect Schedule

In order to assess participants' general affectivity, we used The Expanded version of PANAS-X (Watson & Clark, 1994) adapted for the Romanian population by Cotigă (2011). This self-report scale consists of 46 items, grouped in two dimensions: 22 items measure positive affect (PA) and 24 items negative affect (NA), evaluated on a 5-point Likert scale where 1 means very little or not at all and 5 means very much. The scale has good internal consistency (PA $\alpha = .93$, NA $\alpha = .93$).

An adapted Romanian translation of the short PANAS version (Thompson, 2007) was used to assess participants' state affectivity during the experimental procedure. This adapted short form consists of 11 self-report items, 6 items measure the PA and the other 5 measure the NA. The scale has good internal consistency (PA $\alpha = .89$, NA $\alpha = .67$).

An individual anger score was calculated by averaging the participants' responses at two items from PANAS: furious and mad.

Habitual Emotion Regulation

The items proposed by Medland and colleagues (2020) were used to assess participants' habitual use of cognitive reappraisal. This subscale consists of 4 items assessed on a 5-point Likert scale where 1 means not at all true for me and 5 extremely true for me. The items proposed by Hofmann and Kashdan (2010) were used to assess participants' habitual use of acceptance. This subscale consists of 5 items, assessed on a 5-point Likert scale where 1 means not at all true for me and 5 extremely true for me. The Cronbach's alpha coefficient internal for cognitive reappraisal was $\alpha = .52$, and for acceptance was $\alpha = .68$).

Process and Event Appraisal Questions

To test whether the emotion regulation instructions exerted different effects we used three additional items related to perceived effort ("How hard did you try to follow the instructions?"), difficulty ("How difficult was it to follow the instructions?"), and success ("How successful were you at following the instructions?"). These items were evaluated on a 9-point Likert scale where 0 means not at all and 8 means very much. These items were previously used in a similar study conducted by Troy and colleagues (2018). Additionally, we asked participants the extent to which they were able to propose a win-win situation for solving the recall conflict after implementing the instructions. Furthermore, we asked questions related to the evaluation of the event: the extent to which other persons were responsible for the event, the extent to which the participants were responsible for the event, whether the situation was ongoing for both participants and the other person, and how important is the event. These items were previously used in a study conducted by Kalokerinos and colleagues (2018).

Procedure

The protocol of this study was approved by the Ethics Committee of Ștefan cel Mare, University of Suceava prior to the recruitment of any participants (98/12.12.2022). Additionally, the main hypotheses were pre-registered using the AsPredicted.org platform, on May 15, 2023. The preregistration is available on AsPredicted.org under #132172. Educational Sciences and Psychology undergraduate students were invited to participate in this study. All participants provided informed consent before starting the session. The session began with participants filling out self-report measures that assessed demographic questions, trait affectivity, habitual use of emotion regulation, and general mood. We decided to measure these trait psychological constructs with the aim of testing group equivalence (four experimental groups and one control group). More details are presented in the Results section. The experiment began with a 2-minute breathing exercise to induce a comparable neutral state. All participants received the following instructions: *“Thank you for answering our questions! A short breathing exercise follows. Please sit comfortably in your chair. Breathe in as the circle gets bigger and breathe out as the circle gets smaller. If this pace is very uncomfortable for you, breathe calmly and slowly at your own pace. Please do not stop breathing as directed before the end of the video. When you are ready, please press the forward button”*. Following the baseline period, participants were asked to evaluate how they felt using the adapted short version of PANAS. Furthermore, participants were asked to think of a situation in which they felt very angry when interacting with a significant other (romantic partner, friend, family member, work colleague, or boss). The situation should have been one that had not yet been resolved. Following the remembering phase, the participants were asked to describe the event providing as many details as possible as if it were happening now (*when the event happened, where, what caused it, who said what, who did what, how the participant reacted, how the other person reacted*). The induction procedure took approximately 10 minutes for each participant. Following the description phase, participants were asked to evaluate aspects related to the event and how they felt in that moment.

To measure the effects of emotion regulation strategies on positive and negative affect, participants were randomly assigned to one of the five conditions (four experimental groups: reappraisal, acceptance, simultaneous use of acceptance and reappraisal, and simultaneous use of reappraisal and acceptance; and one control group), and received the emotion regulation instructions on their screens. The instructions for cognitive reappraisal were similar to the ones used in Ray and colleagues' study (2008). Additionally, we decided to use the perspective-taking aspects of reappraisal as Webb and colleagues (2012) suggested that this type of reappraisal was one of the most successful in increasing positive affect and decreasing negative affect. Furthermore, similar instructions for acceptance were used in Hofmann and colleagues' study (2009) and Troy and colleagues' study (2018), derived from ACT (Hayes et al., 1999). In order to create the co-activation emotion regulation instructions, we combined the acceptance and cognitive reappraisal instructions and cognitive reappraisal and acceptance instructions, respectively. For the control group, we decided to instruct participants to respond naturally to the recalled event/emotional experience. More specifically, the instructions were as follows:

Cognitive reappraisal (n = 26): “For the next 5 minutes, think about the event you described earlier in a different, neutral way. Imagine that you are the third person, observing and analyzing this situation in an objective and neutral way. In this case, you should assume that as an observer, you have the best intentions towards each person involved.”

Acceptance (n = 17): “For the next 5 minutes, think about the event you described earlier in a non-judgmental way. Allow yourself to fully experience the emotions you experienced without trying to control or change them. Look at them with curiosity, without judgment.”

Simultaneous use of acceptance and cognitive reappraisal (n = 18) “For the next 5 minutes, think about the event you described earlier in a non-judgmental way. Allow yourself to fully experience the emotions you experienced without trying to control or change them. Look at them with curiosity, without judgment. Now that you have allowed yourself to feel the emotions you are experiencing without judging or changing them, think about the event you described earlier in a different, neutral way. Imagine you are the third person, observing and analyzing this situation in an objective and neutral way. In this case, you should assume that as an observer, you have the best intentions towards each person involved.”

Simultaneous use of cognitive reappraisal and acceptance (n = 15) “For the next 5 minutes think about the event you described earlier in a different, neutral way. Imagine that you are the third person, observing and analyzing this situation in an objective and neutral way. In this case, you should assume that as an observer, you have the best intentions towards each person involved. Now that you have an objective position on what happened, think about the event you described earlier in a non-judgmental way. Allow yourself to fully experience the emotions experienced without trying to control or change them. Look at them with curiosity, without judgment.”

Control group (n = 23) “For the next 5 minutes, think about the event you described earlier as you usually do. Please experience the emotions in a natural way, as you usually do when you feel these emotions in an interaction with the person involved in that situation.”

Upon receiving either of these instructions, participants were asked to describe again the event by receiving the following instructions: “*Now, please describe what you are feeling and all the things you are thinking about it and how you are thinking about them. Please describe how you now see the previously described event.*” In the end, participants were asked to fill out the adapted PANAS short form, the process, and motivation questions. They also filled out the questions related to the event appraisal and win-win solution proposal. The session ended with a general mood question and a written and oral debriefing.

Results

Randomization

Participants were randomly assigned to one of the five groups (four experimental groups: reappraisal, acceptance, simultaneous use of acceptance and

reappraisal, and simultaneous use of reappraisal and acceptance; and one control group). The participants from the five groups were comparable in their levels of trait anger ($F(4, 94) = 2.18, p = .07, \eta^2 = .08$); general positive affect ($F(4, 94) = 1.33, p = .26, \eta^2 = .05$); general negative affect ($F(4, 94) = .27, p = .89, \eta^2 = .01$); stress ($F(4, 94) = .78, p = .53, \eta^2 = .03$); habitual use of cognitive reappraisal ($F(4, 94) = 1.38, p = .24, \eta^2 = .05$) and habitual use of acceptance ($F(4, 94) = 1.06, p = .37, \eta^2 = .04$). Furthermore, no differences were found on other responsibility ($F(4, 94) = 1.02, p = .39, \eta^2 = .04$); self-responsibility ($F(4, 94) = 2.06, p = .09, \eta^2 = .08$); ongoing situation for participants and the other person ($F(4, 94) = .52, p = .71, \eta^2 = .02$), and its importance ($F(4, 94) = .74, p = .56, \eta^2 = .03$).

Manipulation Check

Participants in the experimental conditions (cognitive reappraisal, acceptance, simultaneous use of acceptance and cognitive reappraisal, simultaneous use of reappraisal and acceptance) did not differ significantly in how much effort they put into following the instructions ($F(3, 94) = .42, p = .78, \eta^2 = .01$).

Pre- and Post-Emotion Regulation Effects on Anger, Positive Affect, and Negative Affect

In order to test the first hypothesis, a series of paired sample *t*-tests were conducted to compare the anger level, negative affect level, and positive affect level at baseline and post-instructions.

In order to assess the differences in anger level at the two measurement times, we calculated an average score using the participants' responses to two items from the short version of the PANAS furious and mad. A similar procedure was used by Szasz et al. (2011).

The results showed significant differences on participants' anger level at baseline and post instructions for reappraisal group ($t(25) = 4.96, p < .001, d = .88$); for acceptance group ($t(16) = 2.66, p = .01, d = .81$); for simultaneous use of acceptance and reappraisal group ($t(17) = 5.77, p < .001, d = .83$); and for simultaneous use of reappraisal and acceptance group ($t(14) = 3.36, p = .005, d = .88$). More precisely, for all groups the level of anger intensity decreased following the instructions, having a large effect size, as all indices are higher than .80 (Cohen, 1988). The results also revealed significant differences in participants' negative affect at baseline and post instructions for reappraisal group ($t(25) = 4.65, p < .001, d = .53$); for acceptance group ($t(16) = 2.22, p = .04, d = .67$); for simultaneous use of acceptance and reappraisal group ($t(17) = 7.12, p < .001, d = .45$); for simultaneous use of reappraisal and acceptance group ($t(14) = 3.48, p = .004, d = .63$). As it can be seen, all effect sizes are medium, except for the effect size of simultaneous use of acceptance and reappraisal which is small (Cohen, 1988).

In terms of positive affect, the results revealed significant differences only for the simultaneous use of acceptance and reappraisal group ($t(17) = -2.89, p = .01, d = .78$); while for all other groups, no significant differences in positive affect were

experienced at baseline and post-instructions were found reappraisal group ($t(25) = -1.91, p = .06; d = .85$); for acceptance group ($t(16) = -1.14, p = .26; d = .59$); for simultaneous use of reappraisal and acceptance group ($t(14) = -1.59, p = .13, d = .56$). The effect size for the simultaneous use of acceptance and reappraisal is medium (Cohen, 1988). All these results are presented in Table 1.

Table 1

Comparisons between emotion regulation groups on anger, negative and positive affect

	Anger				Negative affect				Positive affect			
	baseline		post -instructions		Baseline		post- instructions		baseline		post- instructions	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Reappraisal	2.73	.99	1.86	.80	2.53	.41	2.05	.46	2.85	.77	3.17	.93
Acceptance	2.67	.93	2.14	1.16	2.58	.57	2.22	.84	2.70	.84	2.87	.85
Acceptance and Reappraisal	2.94	1.02	1.80	.89	2.87	.65	2.11	.60	2.39	.59	2.93	.67
Reappraisal and acceptance	2.96	1.14	2.20	.86	2.85	.78	2.28	.72	2.63	.89	2.86	.81

Effects of Emotion Regulation on Anger, Positive Affect, and Negative Affect

In order to explore the impact of the emotion regulation instructions on anger levels, positive affect, and negative affect, a series of one-way ANOVAs were conducted with emotion regulation condition as the independent variable and anger, positive affect, and negative affect levels measured post instructions as dependent variables. The results showed no significant differences between cognitive reappraisal, acceptance, simultaneous use of acceptance and cognitive reappraisal, simultaneous use of reappraisal and acceptance and control group on post-instruction anger level $F(4, 94) = 1.06, p = .38, \eta^2 = .04$; post-instruction positive affect $F(4, 94) = 1.05, p = .38, \eta^2 = .04$ or post-instruction negative affect $F(4, 94) = 1.20, p = .31, \eta^2 = .04$. All these results are also presented in Table 1.

Effects of Emotion Regulation on Difficulty, Success, and Proposing a Win-Win Solution

In order to explore the impact of the emotion regulation instructions on difficulty, success, and proposing a win-win solution, a series of one-way ANOVAs were conducted with ability to propose a win-win solution with emotion regulation instructions as independent variable and perceived effort, difficulty, success, and ability to propose a win-win solution as dependent variables. The results showed no significant differences between cognitive reappraisal, acceptance, simultaneous use of acceptance and cognitive reappraisal, simultaneous use of reappraisal and acceptance, and control group on perceived difficulty ($F(4, 94) = 1.31, p = .27, \eta^2 = .05$); on perceived success ($F(4, 94) = .38, p = .82, \eta^2 = .01$); or on proposing a win-win solution for the conflict described ($F(4, 94) = .42, p = .78, \eta^2 = .01$).

Table 2
Comparisons between emotion regulation groups on perceived effort, difficulty, success, and proposing a win-win solution

	Perceived effort		Perceived difficulty		Perceived success		Win-win solution	
	M	SD	M	SD	M	SD	M	SD
Reappraisal	8.04	1.18	3.96	2.56	7.65	1.05	6.38	1.69
Acceptance	8.06	.96	3.29	2.39	7.88	.99	6.12	2.26
Acceptance and Reappraisal	8.39	.77	5.17	2.43	7.89	.96	5.61	2.78
Reappraisal and acceptance	8.00	1.19	4.00	2.23	8.00	1.06	6.40	2.02
Control group	8.00	1.07	4.22	2.62	7.96	1.06	5.91	2.41

Discussion

The aim of this study was to directly investigate the effects of simultaneously co-activating two emotion regulation strategies, acceptance and reappraisal, compared with each strategy individually, on anger, negative and positive affect after experimentally eliciting anger. More specifically, we tested whether all emotion regulation instructions (reappraisal, acceptance, simultaneous use of acceptance and reappraisal, and simultaneous use of reappraisal and acceptance) decreased anger level and negative affect and increased positive affect. Secondly, we tested the effectiveness of acceptance, reappraisal, their simultaneous use, and a control condition in reducing state anger and negative affect, and in increasing positive affect. Thirdly, we tested whether there were differences in perceived effort, difficulty, success, and proposing a win-win solution depending on emotion regulation conditions.

In terms of anger, the results from our first hypothesis showed that as predicted all emotion regulation instructions led to a lower post-instructions anger level. The same pattern of results was found for negative affect. All emotion regulation instructions led, as predicted, to a lower post-instructions negative affect level. These results suggest that all types of emotions regulation are efficient in decreasing anger and negative affect. Additionally, these results are in line with previous studies on the effectiveness of emotion regulation strategies (Webb et al., 2012). However, in terms of positive affect, we found significant pre- to post-instruction differences only for the simultaneous use of acceptance and reappraisal group. These results are consistent with Ford and colleagues' (2019) expectations that when trying to regulate intense negative emotions (e.g. anger), using two strategies (acceptance and reappraisal, in this case) could have a beneficial effect. These results provide additional evidence for the effects of simultaneous use of acceptance and reappraisal on positive affect when regulating anger.

Based on Shallcross and colleagues' (2015) theory we expected that the simultaneous use of acceptance and reappraisal would be the most efficient in decreasing anger and negative affect and increasing positive affect after experimentally inducing anger. However, we found no significant differences between the simultaneous use of acceptance and reappraisal and each individual

strategy: reappraisal, acceptance, and co-activation of reappraisal and acceptance groups. One possible explanation for the lack of significant results might be related to anger intensity. Previous studies suggested that people may use simultaneously two emotion regulation strategies when experiencing strong, intense, and negative emotions and during complex emotional experiences (Aldao & Nolen-Hoeksema, 2013; Ford et al., 2019; Gross, 2015; John & Gross, 2007). We included in this study only those participants who reported at least a moderate level of state negative affect, based on their state negative affect evaluation after the anger induction. The moderate level of negative affect was defined as the mean of the negative emotions' items derived from PANAS-short form ($M = 1.98$, $SD = .85$). However, 1.98 on a 5-point Likert scale may represent a low level of anger elicited, thus other studies should test the simultaneous effects of acceptance and reappraisal compared with the other strategies in a sample where the negative or complex emotion elicited has a higher intensity.

Additionally, no differences between reappraisal and acceptance in terms of anger, negative, and positive affect after experimentally inducing anger were found. In general, previous research suggests that reappraisal is one of the more successful strategies in decreasing anger and negative affect and increasing positive affect (Goldin et al., 2019; Hofmann et al., 2011; Szasz et al., 2011; Troy et al., 2018; Rompilla et al., 2022; Webb et al., 2012; Wolgast et al., 2011). However, other studies suggested that there are no differences between acceptance and reappraisal (Asnaani et al., 2013; Kohl et al., 2012; Wolgast et al., 2011). Our results are in accordance with Wolgast et al. (2011) results. More specifically, they found that both acceptance and reappraisal compared to a control (watch) group led to less unwillingness to view the same video clip again (which was called behavioral avoidance in that study), lesser physiological responses, and less subjective distress. When compared to each other, no differences were found between acceptance and reappraisal in regulating fear and sadness using eliciting video clips. In another study, acceptance and reappraisal had similar effects on startle eye-blink magnitude, a reliable physiological indicator of emotions (Asnaani et al., 2013). Taken together, these results provide additional evidence of the similar effectiveness of acceptance and reappraisal in regulating anger, a high-arousal emotion.

Other possible explanations may be related to the components of acceptance and reappraisal can come from components of acceptance used in the instructions and the type of reappraisal instructed to the participants to be used. For instance, acceptance has two components: willingness which involves being ready and open to experiencing the emotions in a full way, and being present involves focusing on the present moment (Hayes et al., 2006). In the majority of previous studies, participants were instructed to only fully experience the emotions, without trying to control or to change them, which involves only one component, willingness (Asnaani et al., 2013; Goldin et al., 2019; Hofmann et al., 2009; Szasz et al., 2011; Troy et al., 2018; Wolgast et al., 2011). Nevertheless, in a recent study, the acceptance instructions included both components, willingness and being present (Rompilla et al., 2022). The instructions used in our study also include both components.

Regarding reappraisal, in the majority of previous studies the instructions for reappraisal were to reframe the arousing situation in a positive way (Asnaani et

al., 2013; Goldin et al., 2019; Rompilla et al., 2022; Troy et al., 2018). Two other studies instructed participants to take a more realistic perspective, for example, telling participants that there is no reason to be anxious (Hofmann et al., 2009), or that it is preferable for the others to be nice and/or fair to you, but if they are not, this is not something catastrophic (Szasz et al., 2011). In only one study, participants were instructed to think objectively about what they see, but they also instructed participants to detach and to adopt an unemotional attitude (Rompilla et al., 2022). However, in our study, we used a perspective-taking approach as the results of a previous meta-analysis showed that perspective-taking reappraisal was the most efficient type of reappraisal in modulating subjective emotional responses (Webb et al., 2012). Participants were instructed to imagine adopting a third-person perspective, observing and analyzing the situation in an objective and neutral way, having the best intentions toward each person involved. Therefore, our results provided further evidence of the effects of a specific type of reappraisal, perspective-taking on anger, negative and positive affect after experimentally eliciting anger. Additionally, we were able to test a combination of two components of acceptance and its effects on anger, negative and positive affect after experimentally eliciting anger, a need previously suggested by Wojnarowska and colleagues (2020).

We also tested whether there were differences in perceived effort, difficulty, success, and proposing a win-win solution depending on emotion regulation conditions. The results showed no differences between reappraisal, acceptance, co-activation of acceptance and reappraisal, and co-activation of reappraisal and acceptance. The differences in perceived effort, difficulty, and success were also tested in a study that directly assessed the effects of cognitive reappraisal and acceptance on subjective experience, arousal, and perceived cognitive costs (Troy et al., 2018). In terms of perceived effort, they also found no differences based on emotion regulation conditions. This suggested that all participants, regardless of the group to which they were randomly assigned, they tried very hard to follow the instructions received. However, they found significant differences between reappraisal and acceptance in perceived difficulty and success. The results showed that it was more difficult to implement the reappraisal instructions compared to the acceptance instructions. Additionally, participants reported being more successful when implementing the acceptance instructions. Our results seem to be contradictory to Troy and colleagues (2018) study. In Troy and colleagues' (2018) study, sadness, a low arousal emotion, was elicited, while we elicited anger, a high arousal emotion. Furthermore, they used film clips to elicit sadness, we used an autobiographical task where participants recalled an unsolved conflict with a significant other, which is considered a more ecologically valid strategy to elicit real-life emotions (Joseph et al., 2020). Thus, we believe that these results provide additional evidence of the effects of acceptance and reappraisal individually, but also the simultaneous effects of these two strategies on perceived effort, difficulty, success, and proposing a win-win solution after experimentally eliciting anger with an autobiographical task.

Limitations of this study, however, include the small number of participants in each group. Additional knowledge could come from physiological measures when participants are instructed to simultaneously use acceptance and reappraisal

to regulate the emotions elicited by recalling an unresolved anger-provoking event. Future investigations would benefit from testing the effects of simultaneous use of emotion regulation strategies (e.g. acceptance and cognitive reappraisal) after eliciting emotions at higher level of arousal. Another limitation consists of the level of reliability for the habitual use of cognitive reappraisal and acceptance subscales. The reliability was assessed by using Cronbach's alpha which is considered acceptable at .70. Both subscale, cognitive reappraisal subscale ($\alpha = .52$) and the Acceptance subscale ($\alpha = .68$) had alpha coefficients lower than .70, may suggesting a low level of reliability. One possible explanation for these results could be provided by the psychometric theory which suggests that Cronbach's alpha is affected by scale length. In our case, both subscales are short, consisting of 4 and 5 items, respectively (Nunnally et al., 1994; Streiner, 2003).

Conclusions

To our knowledge, this is the first study to investigate the simultaneous effects of two adaptive emotion regulation strategies (acceptance and reappraisal) on anger, negative and positive affect. Our design enabled us to compare the co-activated use of acceptance and reappraisal, and reappraisal and acceptance, respectively with each strategy separately and with a control group where participants were instructed to regulate their emotions as usual. Our findings show that all emotion regulation instructions lead to a lower level of post-instructions anger intensity and negative affect. In terms of positive affect, only the instruction of simultaneous use of acceptance and reappraisal led to a higher level of post-instructions positive emotions. No significant differences were found between cognitive reappraisal, acceptance, simultaneous use of acceptance and cognitive reappraisal, simultaneous use of reappraisal and acceptance, and control group on post-instructions anger level, post-instruction positive affect and post-instruction negative affect.

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Efekti istovremene upotrebe prihvatanja i kognitivnog preispitivanja na ljutnju, pozitivan i negativan afekat nakon eksperimentalnog izazivanja ljutnje

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Značajan broj istraživanja fokusirao se na efikasnost jedne primarne strategije regulacije emocija na subjektivno iskustvo. Međutim, u svakodnevnom životu ljudi često koriste više od jedne strategije da regulišu probuđene emocije. Ova studija koristila je mešoviti nacrt istraživanja da bi istražila efekte dve strategije regulacije emocija (ponovno procenjivanje i prihvatanje) i dve koaktivirane strategije regulacije emocija (prihvatanje i ponovna procena i ponovna procena i prihvatanje) na subjektivno iskustvo ljutnje, pozitivni i negativni afekat nakon eksperimentalnog izazivanja ljutnje. Nakon što su se učesnici ($N = 99$; $AS_{\text{god}} = 25,41$ godina; $SD = 8,81$ godina) prisetili nedavnog nerazrešenog događaja koji kod njih izaziva ljutnju, dobili su instrukcije da ili (1) ponovo procene događaj, (2) prihvate emocije izazvane događajem, (3) prihvate emocije i ponovo procene događaj; (4) da ponovo procene događaj i prihvate svoje izazvane emocije, ili (5) da se nose sa svojim emocijama kao i obično (kontrolna grupa). Rezultati pokazuju da sva uputstva za regulaciju emocija dovode do nižeg nivoa intenziteta ljutnje nakon instrukcija i do negativnog afekta. U smislu pozitivnog afekta, samo instrukcija istovremene upotrebe prihvatanja i preispitivanja dovodi do višeg nivoa pozitivnih emocija nakon instrukcije. Rezultati su pokazali da nema značajnih razlika između kognitivne ponovne procene, prihvatanja, istovremenog korišćenja prihvatanja i kognitivnog preispitivanja, istovremene upotrebe preispitivanja i prihvatanja i kontrolne grupe na nivo ljutnje, pozitivnog afekta, i negativnog afekta posle instrukcije.

Ključne reči: preispitivanje, prihvatanje, ljutnja, zajedničko korišćenje regulacije emocija, pozitivne i negativne emocije, upotreba višestrukih strategija

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