Received: 20 April 2017 | Revised: 27 February 2018 | Accepted: 27 February 2018

DOI: 10.1111/psyp.13086

ORIGINAL ARTICLE

WILEY PSYCHOPHYSIOLOGY SPR

Only reappraisers profit from reappraisal instructions: Effects of instructed and habitual reappraisal on stress responses during interpersonal conflicts

Heidi Mauersberger[1] | **Annekatrin Hoppe**[1] | **Gudrun Brockmann**[2] | **Ursula Hess**[1]

[1]Department of Psychology, Humboldt-Universität zu Berlin, Berlin, Germany

[2]Department of Agricultural and Horticultural Sciences, Humboldt-Universität zu Berlin, Berlin, Germany

Correspondence
Heidi Mauersberger, Department of Psychology, Humboldt-Universität zu Berlin, Rudower Chaussee 18, 12489 Berlin, Germany.
Email: heidi.mauersberger@hu-berlin.de

Funding information
Deutsche Forschungsgemeinschaft (DFG)–German Research Foundation (grant # 0220040399) (to G. B., U. H., A. H.)

Abstract

Conflicts are an undesirable yet common aspect of daily interactions with wide-ranging negative consequences. The present research aimed to examine the buffering effect of experimentally instructed reappraisal on self-reported, physiological and behavioral stress indices during interpersonal conflicts, taking into account habitual emotion regulation strategies. For this, 145 participants experienced a standardized laboratory conflict with the instruction to either reappraise ($n = 48$), to suppress ($n = 50$), or with no instruction ($n = 47$) while cardiovascular and neuroendocrine measures were taken. Participants were allowed to eat sweet and salty snacks during the conflict situation. Prior to as well as after the conflict, participants reported on their subjective stress level. Reappraisal instructions were only effective for high habitual reappraisers who exhibited lower cardiovascular and cortisol reactivity and demonstrated fewer snack-eating behaviors under reappraisal instructions than under suppression or no instructions. The opposite pattern emerged for low habitual reappraisers. Neither experimentally instructed nor habitual reappraisal by itself reduced the negative effects of conflicts. Our findings complement the literature on the diverging effects of instructed reappraisal in tense social interactions.

KEYWORDS

conflict, cortisol, emotion regulation, interbeat interval, reappraisal, social stressor

1 | INTRODUCTION

Interpersonal conflicts are common stressors in all arenas of life (Narayanan, Menon, & Spector, 1999). They have attracted special interest in research on workplace stress, which distinguishes task conflicts from emotional (or relationship) conflicts (Jehn, 1997). Whereas task conflicts, which focus purely on task aspects, can be constructive, as they can help to find better solutions (e.g., Schulz-Hardt, Brodbeck, Mojzisch, Kerschreiter, & Frey, 2006), conflicts that include interpersonal friction and hostility (emotional conflicts) generally have negative consequences. These types of conflict threaten the fundamental human need to maintain high social esteem (e.g., Semmer, Jacobshagen, Meier, & Elfering, 2007) and consequently produce distress and strain (Medina, Munduate, Dorado, Martínez, & Guerra, 2005; Spector & Jex, 1998). Hence, in these potentially negative situations, stress-buffering emotion regulation strategies are especially useful not only at the workplace but also in other life domains.

Two well-researched emotion regulation strategies are (cognitive) reappraisal and (expression) suppression (Gross & John, 2003). Reappraisal refers to reevaluating a situation's meaning to alter the emotional experience and can be used to up- or downregulate emotions or to change the type of emotion experienced (Shiota & Levenson, 2009). In order to downregulate emotions, individuals can either reframe the stressor in an objective, unemotional way (Gross, 1998) or focus on the positive aspects of the event (Shiota & Levenson, 2009). The habitual use of reappraisal is positively related to interpersonal functioning, well-being, and stress resilience (e.g., Carlson, Dikecligil, Greenberg, & Mujica-Parodi, 2012; John & Gross, 2004).

As such, instructing individuals to reappraise should be a promising strategy in a stressful situation. Yet, even though instructed reappraisal is overall an effective strategy according to a meta-analysis by Webb, Miles, and Sheeran (2012), when considering different types of emotional stimuli, instructed reappraisal was more effective for the regulation of emotions elicited by passive picture viewing than by a social stress task. Specifically, the limited research on the use of reappraisal instructions in social settings (e.g., during the discussion of distressing topics or during a social-evaluative speech task) came to contradictory results. In some cases, instructed reappraisal increased (e.g., Denson, Creswell, Terides, & Blundell, 2014), in others it decreased (physiological) stress responses (e.g., Ben-Naim, Hirschberger, Ein-Dor, & Mikulincer, 2013; Gong, Li, Zhang, & Rost, 2016); alternatively no clear effects on (physiological) stress indices emerged (Butler et al., 2003; Butler, Gross, & Barnard, 2014; note that three other (older) studies by Butler and collegues use the same data set as Butler et al., 2014, and are therefore not reported here). Hence, the buffering effects of instructed reappraisal on stress responses seem to be less clear-cut for emotion regulation in a social setting.

1.1 | Nonsocial versus social stressors

There are several reasons for why the effects of instructed reappraisal on stress responses observed during the passive viewing of videos or pictures may not generalize to the demands of social settings. First, when faced with a video or slide, it is possible to withdraw from the situation by closing the eyes, focusing on nonthreatening content, or turning away from the screen. These behaviors are not appropriate in a social situation. Reappraisal requires individuals to override their automatic reaction to the emotional content of an event (e.g., Sheppes & Meiran, 2008) and to cognitively elaborate on the situation. Thus, when instructed reappraisal is used to downregulate emotions elicited by a high intensity stressor such as a social stressor, it may compete for cognitive resources needed for coping with the stressor (Sheppes & Gross, 2011; Sheppes & Meiran, 2008). However, this demand may be less onerous for people who habitually use reappraisal and hence have practice in its use in social contexts. By contrast, individuals who do not habitually engage in reappraisal may find the task to reappraise during a social stressor to be an additional cognitive burden, causing in fact additional stress. The present study addressed the interaction between instructed and habitual forms of emotion regulation in a stressful social setting—during an interpersonal conflict.

1.2 | The present study

The aim of the study was to assess the interaction between emotion regulation instructions and habitual emotion regulation strategies on stress in an interpersonal conflict situation using a multimodal assessment of stress. This question is novel and has not been previously addressed. Based on the considerations above, we predicted that reappraisal instructions would be more effective for individuals who habitually engage in reappraisal to regulate emotions. For individuals who do not habitually engage in reappraisal, higher stress under reappraisal instructions was expected. We included two control conditions: first, a no instruction control condition and, second, a suppression instruction control condition.

Suppression is a less effective emotion regulation strategy, which typically results in negative side effects (see studies by Butler and colleagues, e.g., Butler et al., 2003). However, individuals practiced in suppression do not experience these negative effects to the same degree (Butler, Lee, & Gross, 2007). Hence, suppression instructions may trigger fewer negative effects when used by individuals who habitually engage in suppression to regulate emotions. However, we would not expect that this results in better coping with the stressor. Rather, for people who habitually use suppression, its instructed use should not cause additional stress.

In this study, we assessed stress reactions through self-reported stress, physiological indices of stress (cardiovascular and cortisol reactivity), as well as through snack food intake as a behavioral index of stress (see, e.g., Cartwright et al., 2003; Groesz et al., 2012) during the interpersonal conflict. The effects of reappraisal on eating behaviors during social stressors have not been examined yet, and evidence for the effects of reappraisal on eating behaviors during nonsocial stressors is mixed. Even though Taut, Renner, and Baban (2012) found that reappraisal reduces the likelihood of eating while watching fear-inducing movie clips, other findings regarding the effects of either habitual or instructed reappraisal on the desire to eat and eating behaviors during nonsocial negative emotional situations are less clear (Evers, Marijn Stok, & de Ridder, 2010; Svaldi, Caffier, & Tuschen-Caffier, 2010). However, these studies did not (fully) take into account that people's habitual eating style during stress differs—whereas some people eat more when stressed (stress hyperphagics), others tend to eat less (stress hypophagics), or their eating is not affected by stress (Oliver & Wardle, 1999; Sproesser, Schupp, & Renner, 2014; Zellner et al., 2006). Hence, we expected differential effects of the interaction between emotion regulation instructions and habitual emotion regulation strategies on snack food intake for stress hyper- and hypophagics.

2 | METHOD

2.1 | Participants and design

We based our power analysis for the interaction between instructed and habitual reappraisal on the mean effect size of

a categorical by continuous variable interaction of $f^2 = .059$ observed across three studies by Kafetsios, Andriopoulos, and Papachiou (2014). To detect this effect with an alpha level of .05 and a power of at least .80, a total of 146 individuals (97 women) were recruited via the participant database at the Humboldt-Universität zu Berlin (PESA). As one participant (0.7%) discontinued participation, data from 145 participants (96 women; $M_{age} = 32.2$, $SD_{age} = 12.2$) were included in the analyses. Participants were randomly assigned to one of three conditions: reappraisal ($n = 48$), suppression ($n = 50$), no instruction ($n = 47$). We asked participants to not eat, drink (except for water), chew gum, brush their teeth, or exercise 2 hr prior to the laboratory session. All participants reported being in good health (specifically, no one reported any severe infections, cancer, tumors, immune, autoimmune, or metabolic diseases or endocrine disorders), and nobody took prescription medication (except for oral contraceptives). They participated individually and received either course credit or €10 per hour. The laboratory session lasted approximately 1 hr 20 min. The study was carried out in accordance with the guidelines of the Declaration of Helsinki and was approved by the Institutional Ethics committee. Participants were aware that they had the right to discontinue participation at any time and that their responses were confidential. Men and women were equally distributed across conditions, $\chi^2(2, N = 145) = 0.13$, $p = .937$, as was menstrual cycle phase ($p = .524$, Fisher's exact test).

2.2 | Procedure

One day prior to the laboratory session, participants completed an online questionnaire measuring demographics (sex, age, menstrual cycle phase, smoking behavior), planned time to get up on the next day, habitual emotion regulation strategies, and habitual eating behaviors. Due to equipment malfunction and participants' error (two participants confirmed to have filled out the questionnaire but no data could be matched to their code), online questionnaire data from four participants were missing. Upon arrival at the laboratory, after providing informed consent, participants were seated in a comfortable chair in front of a computer screen and electrodes were attached. After watching a relaxing baseline video during which a baseline cortisol sample was taken, participants reported on their subjective stress level. Then, they engaged in a standardized laboratory task designed to elicit the interpersonal conflict. Depending on the condition, they were instructed to either reappraise or to suppress or received no instruction. Cardiovascular activity was measured continuously. To control for diurnal variation in cortisol levels, conditions were uniformly distributed across morning (9:00–12:00), afternoon (12:00–15:00), and evening (15:00–18:30) sessions, $\chi^2(4, N = 145) = 0.92$, $p = .922$. Participants had the opportunity to eat treats (sweets and salty snacks) during the entire conflict situation. Following the conflict, participants reported again on their subjective stress level, answered some affectively neutral questions, and worked on a riddle until approximately 15 min past the climax of the conflict when poststressor cortisol was taken. Then, participants were asked about the amount of conflict they had experienced during the conflict task and whether they had reappraised or suppressed their emotions during the conflict task. Finally, after completing a postexperimental questionnaire, detaching the electrodes, and measuring participants' height and weight, participants were first asked to report their emotion regulation instructions and then were fully debriefed and all outstanding questions were answered by the investigator. Figure 1 shows the time line for the experimental procedures.

2.3 | Laboratory conflict task

To evoke a standardized but emotionally arousing conflict, we used a task developed by Mauersberger, Hess, and Hoppe (2018). For this, participants discussed the implementation of an organizational measure with a same sex interaction partner via video messages. This individual, in fact, did not exist, and all answers were prerecorded and carefully programmed to match participants' choices in a way that created a task

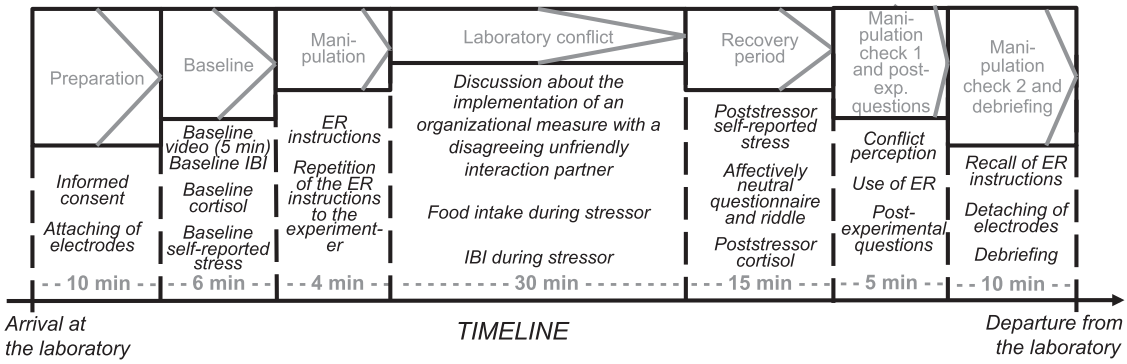

FIGURE 1 Time line for the experimental procedures. IBI = interbeat interval. ER = emotion regulation

conflict. As the simulated participant additionally behaved in an unfriendly and malicious manner, an emotional conflict emerged in addition to the task conflict.

The conflict task consisted of two blocks—a first block where the content of an organizational measure and a second block where the precise realization of the measure were discussed. A random choice was simulated such that participants always started the discussion. Participants took position regarding several aspects of the implementation of the organizational measure by choosing one of several options from a list. Once an option was chosen, participants were asked to explain their choices in a video statement. They then received a video statement from the virtual interaction partner (based on their response choices) who systematically argued against their choices in an unfriendly manner (see online supporting information Appendix S1 for an exemplary range of options and an exemplary response of a simulated interaction partner to one of those options). The conflict reached its climax after an exchange of 13 video messages when participants had to watch their interaction partners submit the final evaluation of the collaboration: They were told in a resolute and unempathic way that all their choices were inconclusive and that their line of argument was foolish throughout. The conflict task was validated with an independent sample (see supporting information Appendix S1 for validation data).

2.4 | Emotion regulation instructions

Participants received emotion regulation instructions prior to the conflict task as part of the written instructions presented on screen. The instructions for the reappraisal condition were: "During the following team activity, think about the situation in such a way that you remain calm and dispassionate," and for the suppression condition: "During the following team activity, behave in such a way that your partner does not know you are feeling any emotions at all" (Butler et al., 2003). In the no instruction condition, no instructions were given. To ensure full understanding of the instructions, participants repeated the instructions in their own words to the experimenter immediately after reading them.

2.5 | Self-report measures

2.5.1 | Habitual emotion regulation strategies

We used the German version of the Emotion Regulation Questionnaire (Gross & John, 2003) by Abler & Kessler (2009) to measure habitual reappraisal ($\alpha = .86$) and habitual suppression ($\alpha = .78$) with 10 items. Participants indicated their agreement or disagreement with each item on a 7-point response scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*. Data from one participant were excluded, as responses to several items were missing.

2.5.2 | Habitual eating behaviors

The habitual tendency to eat in response to interpersonal stress was measured with one item using a 5-point response scale: "When other people cause me stress (e.g., partner, friends, relatives, colleagues), I eat … 1 = *much less than usual*, 2 = *less than usual*, 3 = *the same as usual*, 4 = *more than usual*, 5 = *much more than usual*" (see Sproesser et al., 2014). Further, emotional eating was measured with the subscale "emotional eating behaviors" of the German version of the Dutch Eating Behavior Questionnaire (Van Strien, Frijters, Bergers, & Defares, 1986) by Grunert, 1989. Participants had to answer the 10 items on a 5-point response scale anchored with 1 = *never* and 5 = *very often* ($\alpha = .92$).

2.5.3 | Self-reported stress

To reduce participants' awareness of our aim to assess their subjective stress level, we embedded the relevant items into a questionnaire that supposedly measures physical sensation relevant to a laboratory task (e.g., eyes hurting, tense muscles, see Hess & Blairy, 2001). On a 7-point response scale anchored with 1 = *not at all* and 7 = *very much*, participants rated the degree to which they felt stressed and relaxed in this very moment ($\alpha_{baseline} = .60$, $\alpha_{postconflict} = .66$). Self-reported stress reactivity was calculated by subtracting the score prior to the conflict from the score after the conflict.

2.5.4 | Conflict perception

The German version of Jehn's Conflict Scale (Jehn, 1995) by Lehmann-Willenbrock, Grohmann, and Kauffeld (2011) was adapted for the laboratory setting. Specifically, we asked for the presence or absence, respectively, of conflicts during the conflict task and, if present, participants were asked to rate the intensity and not the frequency of task conflicts (e.g., "How intense were these differences of opinion between you and your interaction partner?"; $\alpha = .57$) and emotional conflicts (e.g., "How intense were these tensions between you and your interaction partner?"; $\alpha = .83$) on a 6-point response scale (from 1 = *mild* to 6 = *intense*).

2.5.5 | Use of reappraisal and suppression

Participants rated the degree (from 1 = *not at all* to 5 = *very much*) (a) to which they thought about the situation in such a way that they remained calm and objective, and (b) to which they behaved in such a way that their partners did not recognize that they were feeling any emotions.

2.5.6 | Postexperimental questions

Participants answered several questions regarding the perceived relationship quality ("I felt understood/respected/taken seriously"; $\alpha = .78$), the perceived (communication) competence of the interaction partner ("My interaction partner was competent/attentive/expressive/used more constructive criticism/used less destructive criticism/had an informed opinion," "I took my interaction partner seriously"; $\alpha = .66$), the perceived positive stance of the interaction partner ("My interaction partner was friendly/showed positive emotions," "In spite of discrepancies in opinion, we liked each other"; $\alpha = .66$), the negative stance of the interaction partner ("My interaction partner showed negative emotions") and their own engagement in the task ("It worked out well for me to discuss [the implementation of the organizational measure] via video messages") on a 7-point response scale (from 1 = *not at all* to 7 = *very much*). Data from one participant were excluded due to an abnormal response pattern.

2.6 | Physiological and behavioral measures

2.6.1 | Cardiovascular activity

Electrocardiography (ECG) was continuously recorded at a sampling rate of 1000 Hz. For this, after the skin was cleansed with rubbing alcohol, two prejelled Mindware Ag/AgCl snap disposable vinyl electrodes were placed on the participants' right collarbone and left lower rib, and one prejelled Mindware Ag/AgCl snap disposable vinyl reference electrode was placed on participants' right lower rib. A Mindware BioNex impedance cardiograph amplifier with a band-pass filter of 0.5 Hz–100 Hz (and a 50 Hz notch filter) was used, and the ECG signal was converted into R-wave intervals. Artifacts and recording errors were corrected manually. Interbeat interval (IBI) data from two participants (one in the reappraisal condition, one in the suppression condition) were removed from the analyses due to excessive artifacts. IBI reactivity was calculated by subtracting baseline IBI (i.e., average IBI during the 5 min of the baseline video) from the average IBI during the last video message that participants received from interaction partners, which lasted approximately 40 s.

2.6.2 | Salivary cortisol

Saliva was collected using standard Salivettes (Sarstedt AG & Co., Nümbrecht, Germany). Participants were asked to place the swab in their mouth and were instructed to gently chew on it for about 90 s (until saturated with saliva) and then replace it in the tube. Pre- and postconflict salivary cortisol samples were stored at −20°C in a freezer in our laboratory before being sent to the Laboratory of Biopsychology at the Technical University of Dresden, Germany, for analysis. After thawing, Salivettes were centrifuged at 3,000 rpm for 5 min, which resulted in a clear supernatant of low viscosity. Salivary cortisol concentrations were measured using a commercial immunoassay kit with chemiluminescence detection (IBL International, Hamburg, Germany). Intraassay and interassay coefficients of variations were below 8%. The lower limit of detection was 0.43 nmol/liter. All saliva samples had detectable levels of cortisol. Cortisol reactivity was calculated by subtracting log-transformed baseline salivary cortisol (i.e., salivary cortisol during the 5 min of the baseline video) from the log-transformed salivary cortisol approximately 15 min past the end of the conflict task.

2.6.3 | Food intake

Food bowls were placed on the table next to the computer screen at the beginning of the procedure. To account for the differences in preferences for salty or sweet food, food bowls were filled with salted pretzels, M&Ms, and gummy bears. The food was presented as an incentive for participation, and participants were encouraged to help themselves. The food bowls were weighed at the beginning and at the end of the experiment. The index for food intake was created by subtracting the final from the initial weight. Data from five participants were removed from the analyses due to food intake scores > 3 interquartile range from the 75th percentile.

3 | RESULTS

Preliminary analyses of variance (ANOVAs) with condition as factor indicated that participants in different conditions did not differ significantly in their habitual use of reappraisal, $F(2, 137) = 0.02$, $p = .984$, $\eta_p^2 < .001$, or suppression, $F(2, 137) = 0.04$, $p = .958$, $\eta_p^2 = .001$, their habitual eating behaviors (eating in response to interpersonal stress, $F(2, 138) = 0.88$, $p = .418$, $\eta_p^2 = .013$, emotional eating, $F(2, 138) = 0.05$, $p = .955$, $\eta_p^2 = .001$), their baseline self-reported stress, $F(2, 142) = 0.72$, $p = .489$, $\eta_p^2 = .010$, their baseline IBI, $F(2, 140) = 0.001$, $p = .999$, $\eta_p^2 < .001$, or baseline cortisol, $F(2, 142) = 0.90$, $p = .409$, $\eta_p^2 = .013$. Further, across conditions, one-sample t tests revealed that nearly all participants perceived a task conflict, $M = 100\%$, $t(144) = 307$, $p < .001$, $d = 25.5$, $CI_{95\%} = [99\%, 100\%]$, as well as an emotional conflict, $M = 97\%$, $t(144) = 102$, $p < .001$, $d = 8.49$, $CI_{95\%} = [95\%, 99\%]$, during the conflict task.

In order to examine whether conditions had distinct effects as a function of habitual emotion regulation strategies, we created two dummy-coded variables based on the categorical instruction variable (which was comprised of the three conditions: reappraisal, suppression, and no instruction, with the no instruction condition as the reference group). In all following regression analyses, continuous variables were z-standardized, and interaction terms were calculated by

multiplying z-standardized continuous variables with dummy-coded mean centered categorical variables. To account for potential violations of homoscedasticity,[1] we used robust standard error estimators for the regression coefficients.

3.1 | Manipulation check

We had predicted that the effect of emotion regulation instructions on the implementation of the instructions would be moderated by participants' habitual preference for emotion regulation. Hence, no main effect of condition was expected. To test our assumptions, we first conducted an ANOVA with condition as factor, which revealed no significant difference in reported use of reappraisal between conditions: $F(2, 142) = 0.43$, $p = .653$, $\eta_p^2 = .006$. We then conducted a multiple regression analysis to predict the reported use of reappraisal during the conflict task from condition and habitual reappraisal. That is, use of reappraisal was regressed on the reappraisal and suppression condition contrast, as well as on habitual reappraisal (Step 1) and on the interaction between the reappraisal condition contrast and habitual reappraisal (Step 2). Results revealed that only habitual reappraisal ($\beta = .26$, $p = .018$) but not the reappraisal condition contrast was significantly associated with reported use of reappraisal during the conflict task. Further, as expected, the interaction between the reappraisal condition contrast and habitual reappraisal was significant ($\beta = .55$, $p = .041$). Probing the interaction effect following Aiken and West's (1991) instructions (see Figure 2 for a visualization of the simple slopes) showed that only high habitual reappraisers (here and in the following, *high* always refers to scores 1 *SD* above the mean) reported using significantly more reappraisal in the reappraisal condition compared to the other two conditions (simple slope $z = .46$ (.23), $t = 2.00$, $p = .047$). This effect reverses for low habitual reappraisers (here and in the following, *low* always refers to scores 1 *SD* below the mean); however, the simple slope was not significant. As it is an arbitrary decision whether the condition or the habitual emotion regulation strategy should function as moderator, we also conducted simple slope analyses where we used the condition as moderator: Simple slope analyses revealed that participants used significantly more reappraisal with increasing levels of habitual reappraisal in the reappraisal condition (simple slope $z = .63$ (.25), $t = 2.58$, $p = .011$). No such effects could be found in the other two conditions.

With regard to the use of suppression, we similarly first conducted an ANOVA with condition as factor, which also revealed no significant difference in reported use of suppression between conditions: $F(2, 142) = 1.72$, $p = .184$, $\eta_p^2 = .024$. Then, we regressed use of suppression on the reappraisal and suppression condition contrast, as well as on habitual suppression (Step 1) and on the interaction between the suppression condition contrast and habitual suppression (Step 2). No significant effects emerged for the first step ($ps \geq .081$). However, the suppression condition contrast by habitual suppression interaction term indicated a significant differential effect for high and low habitual suppressors ($\beta = .36$, $p = .018$, see Figure 2). Similarly to the results for reappraisal, simple slope analyses revealed that high habitual suppressors reported using significantly more suppression in the suppression condition compared to the other two conditions (simple slope $z = .70$ (.26), $t = 2.74$, $p = .007$). In contrast, no such effects could be found for low habitual suppressors. Further, when condition was used as moderator, we found that, in the suppression condition, participants used significantly more suppression with increasing levels of habitual suppression (simple slope $z = .30$ (.10), $t = 3.04$, $p = .003$). No such effects could be found in the other two conditions.

In sum, self-reports obtained after the conflict task suggested that participants who typically engage in reappraisal or suppression used the respective strategy more when instructed to do so than when instructed to do something else or not instructed at all and than participants who typically do not engage in reappraisal or suppression.

3.2 | The effect of emotion regulation instructions and habitual emotion regulation strategies on stress indices

We had predicted that the effect of emotion regulation instructions on stress indices would be moderated by participants' habitual preference for emotion regulation. As several ANOVAs with condition as factor did not reveal significant differences between conditions for any of the stress indices ($ps \geq .141$), we conducted multiple regression analyses on the stress indices (self-reported stress reactivity, IBI reactivity, cortisol reactivity, and food intake) to assess the effects of reappraisal condition and habitual reappraisal as well as of suppression condition and habitual suppression (Step 1). Only the main effect of habitual suppression reached significance for IBI reactivity and food intake as dependent variables: Habitual suppression significantly reduced IBI reactivity and increased food intake. No other main effects emerged (see Table 1 for the exact coefficients). Yet, when adding the interaction terms between condition and habitual emotion regulation strategy (Step 2), a significant reappraisal condition contrast by habitual reappraisal interaction emerged for IBI reactivity, cortisol reactivity, and food intake. Simple slope

[1]There is reason to suspect problems with homoscedasticity in one of the regression analyses: Similar to Taut, Renner, and Baban (2012), participants were free to eat snacks during the conflict task. Hence, only 63% of the participants started to eat, which resulted in a right-skewed distribution of the food intake measure.

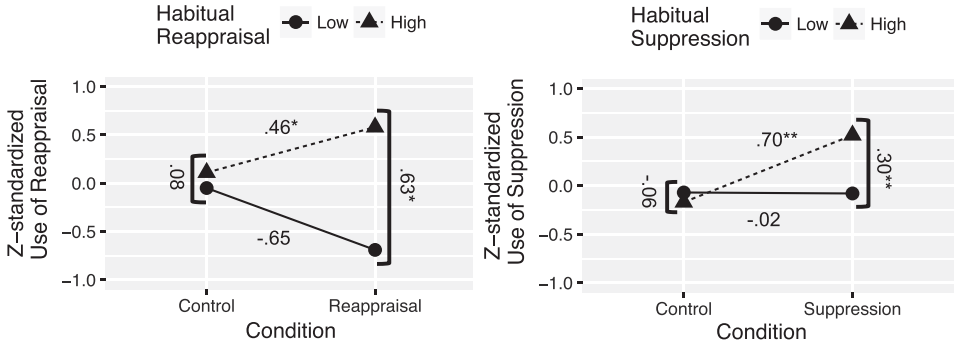

FIGURE 2 Interaction between reappraisal condition and habitual reappraisal on use of reappraisal and interaction between suppression condition and habitual suppression on use of suppression. "Control" refers to the other two conditions. Asterisks display significance of simple slopes (*$p < .05$, **$p < .01$)

analyses indicated that high habitual reappraisers showed significantly lower cortisol reactivity (simple slope $z = -.66$ (.25), $t = -2.62$, $p = .010$), and low habitual reappraisers showed significantly higher cortisol reactivity (simple slope $z = .59$ (.27), $t = 2.20$, $p = .029$) in the reappraisal condition compared to the other two conditions. Further, high habitual reappraisers ate significantly less (simple slope $z = -.81$ (.23), $t = -3.61$, $p < .001$) and low habitual reappraisers ate more (albeit not significantly more) in the reappraisal condition compared to the other two conditions (see Figure 3 for a visualization of the simple slopes). It should be noted that this effect was further qualified by habitual eating in response to interpersonal stress and that similar results could be found when considering only those participants who ate at all and when only eating versus noneating was examined (see supporting information Appendix S1 for additional analyses). A similar pattern without significant simple slopes emerged for IBI reactivity (larger IBI difference scores for high habitual reappraisers and smaller IBI difference scores for low habitual reappraisers in the reappraisal condition compared to the other two conditions, see Figure 3). Simple slope analyses with condition as moderator revealed three significant effects: In the reappraisal condition, participants showed significantly larger IBI difference scores (simple slope $z = .35$ (.14), $t = 2.56$, $p = .012$), significantly lower cortisol reactivity (simple slope $z = -.42$ (.11), $t = -3.81$, $p < .001$), and significantly reduced food intake (simple slope $z = -.29$ (.14), $t = -2.04$, $p = .044$) with increasing levels of habitual reappraisal. No such effects could be found in the other two conditions.

No significant main effects or interaction effects emerged for self-reported stress reactivity. Inspection of the means of high and low habitual reappraisers (see Figure 3) revealed that low habitual reappraisers reported higher stress reactivity in the reappraisal condition than either high habitual reappraisers in the reappraisal condition or high or low habitual reappraisers in the other two conditions. However, this difference was not significant. In sum, only participants who typically engage in reappraisal showed evidence of reduced

TABLE 1 Effects of condition and habitual emotion regulation on four indices of stress

	Stress reactivity		IBI reactivity		Cortisol reactivity		Food intake	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Step 1		.04		.08*		.01		.07
Reappraisal condition	.24		−.01		−.04		−.33	
Habitual reappraisal	−.06		.10		.01		.04	
Suppression condition	.27		.02		.07		.07	
Habitual suppression	.14		−.26**		.05		.16*	
Step 2		.01		.04		.09**		.06*
Reappraisal Condition × Habitual Reappraisal	−.19		.39*		−.63***		−.49**	
Suppression Condition × Habitual Suppression	.05		−.12		.09		−.20	
Total R^2		.05		.12*		.10*		.12**
N	140		139		140		135	

Note. IBI = interbeat interval.
*$p < .05$. **$p < .01$. ***$p < .001$.

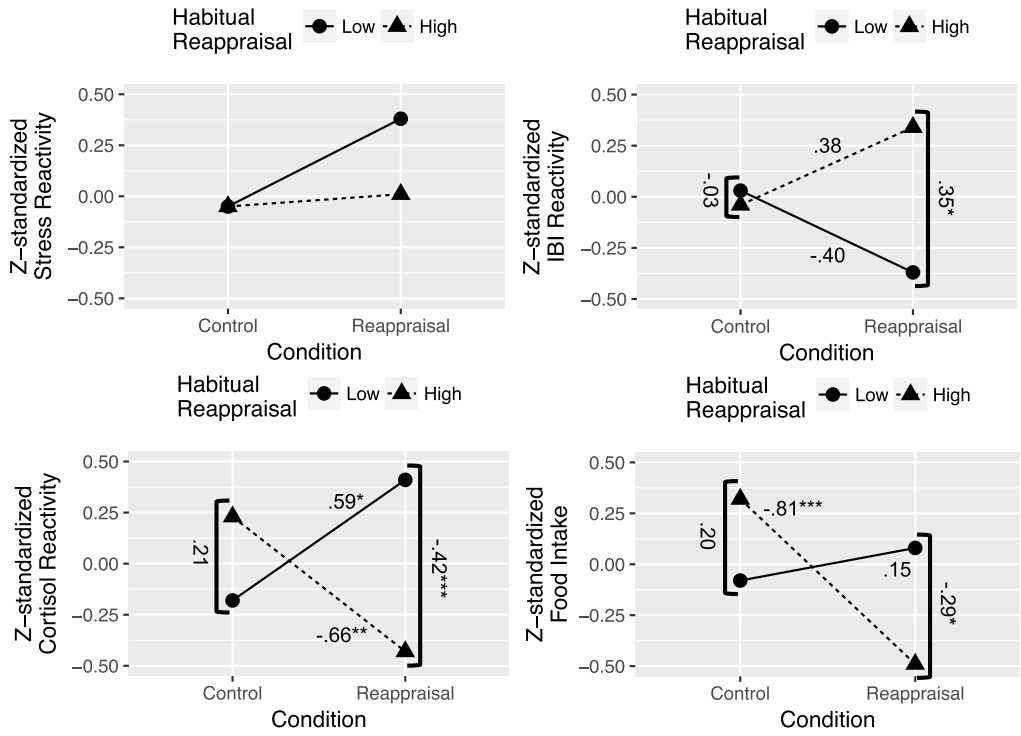

FIGURE 3 Interaction between reappraisal condition and habitual reappraisal on four indices of stress. "Control" refers to the other two conditions. IBI = interbeat interval. Asterisks display significance of simple slopes (*$p < .05$, **$p < .01$, ***$p < .001$)

stress in terms of physiological stress indices and snack food consumption when instructed to reappraise.

Several factors are known to influence physiological stress reactivity such as sex, age, body mass index (BMI), hours awake, smoking, menstrual cycle phase, and use of oral contraceptives (Dickerson & Kemeny, 2004; Foley & Kirschbaum, 2010; Kirschbaum, Kudielka, Gaab, Schommer, & Hellhammer, 1999). Further, sex, age, BMI, smoking, and habitual eating behaviors influence the amount of snack food eaten under stressful conditions (Grunberg, 1982; Grunberg & Straub, 1992; Zellner et al., 2006). Supplementary analyses including these variables were carried out (see supporting information Appendix S1) and confirmed that even though one or the other control variable influenced IBI reactivity, cortisol reactivity, or food intake, the interaction between the reappraisal condition contrast and habitual reappraisal remained significant throughout the analyses. Further, supplementary analyses (see supporting information Appendix S1) revealed the same results when separate models for reappraisal and suppression were run.

3.3 | Exploratory analyses

In search of potential reasons for why only individuals who habitually reappraise benefit from the stress-alleviating effects of instructed reappraisal, we conducted exploratory analyses on participants' perceptions of the relationship quality, the competence of the interaction partner, the positive and negative stance of the interaction partner, as well as on their engagement in the conflict task, which were assessed at the end of the experimental session. Similar to the analyses of condition and habitual emotion regulation strategy on stress, a significant interaction between the reappraisal condition contrast and habitual reappraisal emerged for relationship quality, $\beta = .41$, $p = .015$, and for the competence of the interaction partner, $\beta = .45$, $p = .005$. Further, we found a significant main effect of the reappraisal condition contrast on the competence of the interaction partner, $\beta = .40$, $p = .046$. Yet, this significant main effect was qualified by the significant interaction effect: Simple slope analyses indicated that high habitual reappraisers perceived interaction partners as significantly more competent in the reappraisal condition compared to the other two conditions (simple slope $z = .86$ (.26), $t = 3.26$, $p = .001$). However, this was not the case for low habitual reappraisers. Simple slope analyses revealed a similar pattern, albeit without significant simple slopes, for relationship quality (higher relationship quality for high habitual reappraisers and lower relationship quality for low habitual reappraisers in the reappraisal condition compared to the other two conditions). Further, when condition was used as moderator, results revealed that participants perceived interaction partners as significantly more competent (simple slope $z = .24$ (.11), $t = 2.11$, $p = .036$), and experienced significantly higher relationship quality (simple

slope $z = .28$ (.12), $t = 2.42$, $p = .017$) in the reappraisal condition with increasing levels of habitual reappraisal. No such effects could be found in the other two conditions. This finding suggests that the overall interaction quality is lower for individuals who do not habitually reappraise but are instructed to do so. One can speculate that this is due to a higher cognitive load posed by the unfamiliar regulation task, which allowed less focus on the interaction (see Butler et al., 2007, for a similar argument).

4 | DISCUSSION

In Western cultures, reappraisal tends to be associated with clear benefits, whereas suppression is seen as a maladaptive emotion regulation strategy (Gross, 1998). We examined the interaction between emotion regulation instructions and habitual emotion regulation strategies on stress in an interpersonal conflict situation modeled on a workplace conflict. In line with previous research (see, e.g., Lam, Dickerson, Zoccola, & Zaldivar, 2009), we found that habitual suppression had adverse effects on physiological and behavioral measures of stress (cardiovascular reactivity and amount of snack food intake). Further, high habitual suppressors seemed to accrue even more negative effects when additionally instructed to suppress (see supporting information Appendix S1). This is in contrast to findings that individuals practiced in suppression can use this strategy more successfully (Butler et al., 2007). However, in the case of Butler and colleagues, the use of suppression was culturally adequate and hence its users may have learned to use it successfully in that context.

More importantly, the present findings suggest that instructing a person to reappraise a situation is not always effective. We did not find a buffering effect of reappraisal instructions. This is in line with previous research that focused on reappraisal in social settings (Butler et al., 2003; Denson et al., 2014). In an extension of previous findings, we found that under reappraisal instructions only high habitual reappraisers successfully downregulated their emotions as shown by physiological and behavioral stress indices.[2] In contrast, low habitual reappraisers experienced the interpersonal conflict as particularly negative when instructed to reappraise than when given other or no instructions. This is suggestive of the notion that being required to reappraise during a demanding social interaction "backfires" on those who have little experience with this strategy. In fact, it seems that the resulting inadequate implementation of the reappraisal instructions increased stress in low habitual reappraisers, because the inhibition of their habitual emotion regulation strategy in order to try and reappraise consumed cognitive resources that could have been used to address the stressful event. An alternative hypothesis could be that low habitual reappraisers simply forgot their instructions. However, debriefing interviews showed that only five participants did not clearly remember the content of the instructions they received prior to the interpersonal conflict. Hence, a lack of expertise in the use of reappraisal is more likely the reason for the failure to implement the strategy successfully.

In sum, in interpersonal conflicts or similarly demanding social situations, it does not suffice to simply instruct people to reappraise. Rather, in order for reappraisal to be effective in complex everyday social stress situations, it has to become a habitual reaction. Emotion regulation abilities are skills that can be expanded and trained (Arthur, Bennett, Edens, & Bell, 2003; Berking & Lukas, 2015). Only if reappraisal instructions are internalized and practiced can they work effectively in real-life situations.

4.1 | Self-reported, physiological, and behavioral measures of stress

We observed that high habitual reappraisers under reappraisal instructions experienced lower stress measured with physiological (i.e., cardiovascular and cortisol reactivity) and behavioral (i.e., amount of snack food intake) stress indices. However, we did not find effects on self-reported stress. At first glance this is concerning, as we would expect that successful downregulation via reappraisal use should be evident to the participants themselves as well. Yet, whereas the physiological and behavioral measures were taken during the conflict task (due to the time delay of cortisol responses, cortisol levels measured after a stressor actually reflect physiological stress levels during a stressor), self-report was obtained after the conflict task. It is possible that by that time effects had already diminished. It is also possible that the lack of effects in self-reported stress for high habitual reappraisers reflects the "mood-buffering cortisol effect" (Het, Schoofs, Rohleder, & Wolf, 2012). This effect implies that poststress negative affect inversely relates to cortisol levels during a stressor. Het et al. (2012) suggest that a pronounced cortisol response may help to cope with negative affect and thus leads to an attenuated negative affect after the end of the stressor. Thus, it is possible that high habitual reappraisers who were asked to reappraise reported lower levels of stress after the conflict because of an effective use of this strategy. In contrast, the other groups reported lower levels of stress after the end of

[2]The reason for the stress-buffering effect of reappraisal instructions for high habitual reappraisers may be that they were the ones who engaged in reappraisal the strongest. Yet, note that even though high habitual reappraisers in the reappraisal condition reported using reappraisal more intensively than low and high habitual reappraisers in all other conditions, the overall use of reappraisal was high throughout conditions. Thus, all participants reported that they have reframed the meaning of the event to a certain degree, probably as a means to protect the self (which has been severely attacked by the interaction partner during the conflict task).

the conflict because by that time the mood-buffering cortisol effect had set in. To avoid discrepancies between physiological and self-reported measures of stress, Campbell and Ehlert (2012) suggest using repeated real-time evaluations of subjective stress. However, in the framework of a realistic interpersonal conflict situation, real-time stress evaluations would have been disruptive to the development of the conflict.

4.2 | Content of the reappraisal instructions

It is important to keep in mind that research on the effects of reappraisal instructions during passive viewing tasks demonstrated the effectiveness of this strategy (Webb et al., 2012). Yet, simple instructions fail during a complex social interaction for those not already familiar with reappraisal. We suggest that this is due to the additional cognitive effort that is required to adequately reframe the underlying emotional meaning of the complex interpersonal situation. Yet, this is not the only way to instruct people to reappraise. Specifically, participants who first learn about the functionality of physiological arousal and then are told to appraise their arousal as adaptive instead of maladaptive generally profit from reappraisal instructions within stressful social situations. Even though no differences in subjective stress emerged, instructed arousal reappraisal was found to improve cardiovascular functioning (indexed by greater cardiac output and lower vascular resistance) compared to the use of no or other instructions, probably because it raised the level of perceived resources and hence lowered the appraisal of the stressor as a threat (Jamieson, Nock, & Mendes, 2012). These benefits of arousal reappraisal also extend to socially anxious individuals: Jamieson, Nock, and Mendes (2013) could replicate the adaptive physiological pattern of arousal reappraisal for a sample consisting of both individuals with and without social anxiety disorder. It would be interesting to assess the interaction of instructed and habitual arousal reappraisal. If this form of reappraisal is less distracting for novice users, it may be a useful strategy for ad hoc use.

4.3 | Strengths and limitations

To the best of our knowledge, the present study is the first that investigated the interaction between emotion regulation instructions and habitual emotion regulation strategies on stress during an interpersonal conflict. Yet, this study has also some limitations. First, cortisol was measured only once before and once after the conflict. Due to the variation in salivary cortisol peak time between individuals (Dickerson & Kemeny, 2004; Foley & Kirschbaum, 2010), it would have been more desirable to measure poststressor cortisol more than once to make sure to capture the peak for all participants.

Also, while we could show that reappraisal instructions helped high habitual reappraisers to better cope with stress during the acute interpersonal conflict, it remains to be seen whether the observed stress-buffering effect of reappraisal also helps with regard to the eventual resolution of the interpersonal conflict. When reappraising a situation, people try to change perspectives and try to be more objective and less emotional (Gross, 1998). On the one hand, this behavior may increase empathy for a counterpart, as one strives to understand others' intentions as well as the reasons for their actions (e.g., Batson et al., 1997, used perspective taking to manipulate the level of empathy toward others). This notion seems supported by the postexperimental assessment of the interaction. Under reappraisal instructions, high habitual reappraisers considered their interaction partners to be more competent and reported higher relationship quality.

On the other hand, it is also possible that in some situations a more objective stance also means distancing oneself from the problematic issue, which in consequence interferes with the problem-solving process (Folkman, 2013). Detaching from an emotionally arousing situation may even further decrease mutual liking and cooperation, as interaction partners may perceive this rational and distant behavior as even more provoking and irritating. Notably, mutual liking and perceived friendliness of the interaction partner was not increased in high habitual reappraisers who received reappraisal instructions (but also not decreased). Future research should consider measures of conflict outcomes (such as conflict handling styles) as well as reports of interaction quality collected by all conflict parties to round out this picture.

4.4 | Conclusions

A number of laboratory studies have investigated the effect of instructed reappraisal on well-being during unpleasant social and nonsocial situations. Whereas studies examining nonsocial stressors found consistent positive effects of instructed reappraisal on different kinds of stress indices, studies investigating social stressors revealed inconsistent effects of instructed reappraisal on stress. We investigated whether habitual emotion regulation strategies act as a moderator on the relationship between emotion regulation instructions and social stress during an interpersonal conflict. In accordance with our assumptions, we found that the effect of emotion regulation instructions was moderated by individuals' habitual strategies and acquired competencies. These findings underline the demanding nature of emotion regulation and the adverse effects of unsuccessful emotion regulation attempts in an already demanding socially stressful situation, when the emotion regulation strategy used has not been previously acquired.

ACKNOWLEDGMENTS

Data collection of this study was supported by grant No. 0220040399 to Gudrun Brockmann, Ursula Hess, and Annekatrin Hoppe.

REFERENCES

Abler, B., & Kessler, H. (2009). Eine deutschsprachige Fassung des ERQ von Gross und John [Emotion Regulation Questionnaire]. *Diagnostica*, *55*(3), 144–152. https://doi.org/10.1026/0012-1924.55.3.144

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage Publications. https://doi.org/10.1037/0021-9010.84.6.897

Arthur, W., Bennett, W., Edens, P. S., & Bell, S. T. (2003). Effectiveness of training in organizations: A meta-analysis of design and evaluation features. *Journal of Applied Psychology*, *88*(2), 234–245. https://doi.org/10.1037/0021-9010.88.2.234

Batson, C. D., Polycarpou, M. P., Harmon-Jones, E., Imhoff, H. J., Mitchener, E. C., Bednar, L. L., … Highberger, L. (1997). Empathy and attitudes: Can feeling for a member of a stigmatized group improve feelings toward the group? *Journal of Personality and Social Psychology*, *72*(1), 105–118. https://doi.org/10.1037/0022-3514.72.1.105

Ben-Naim, S., Hirschberger, G., Ein-Dor, T., & Mikulincer, M. (2013). An experimental study of emotion regulation during relationship conflict interactions: The moderating role of attachment orientations. *Emotion*, *13*(3), 506–519. https://doi.org/10.1037/a0031473

Berking, M., & Lukas, C. A. (2015). The Affect Regulation Training (ART): A transdiagnostic approach to the prevention and treatment of mental disorders. *Current Opinion in Psychology*, *3*, 64–69. https://doi.org/10.1016/j.copsyc.2015.02.002

Butler, E. A., Egloff, B., Wilhelm, F. H., Smith, N. C., Erickson, E. A., & Gross, J. J. (2003). The social consequences of expressive suppression. *Emotion*, *3*(1), 48–67. https://doi.org/10.1037/1528-3542.3.1.48

Butler, E. A., Gross, J. J., & Barnard, K. (2014). Testing the effects of suppression and reappraisal on emotional concordance using a multivariate multilevel model. *Biological Psychology*, *98*(1), 6–18. https://doi.org/10.1016/j.biopsycho.2013.09.003

Butler, E. A., Lee, T. L., & Gross, J. J. (2007). Emotion regulation and culture: Are the social consequences of emotion suppression culture-specific? *Emotion*, *7*(1), 30–48. https://doi.org/10.1037/1528-3542.7.1.30

Campbell, J., & Ehlert, U. (2012). Acute psychosocial stress: Does the emotional stress response correspond with physiological responses? *Psychoneuroendocrinology*, *37*(8), 1111–1134. https://doi.org/10.1016/j.psyneuen.2011.12.010

Carlson, J. M., Dikecligil, G. N., Greenberg, T., & Mujica-Parodi, L. R. (2012). Trait reappraisal is associated with resilience to acute psychological stress. *Journal of Research in Personality*, *46*(5), 609–613. https://doi.org/10.1016/j.jrp.2012.05.003

Cartwright, M., Wardle, J., Steggles, N., Simon, A. E., Croker, H., & Jarvis, M. J. (2003). Stress and dietary practices in adolescents. *Health Psychology*, *22*(4), 362–369. https://doi.org/10.1037/0278-6133.22.4.362

Denson, T. F., Creswell, J. D., Terides, M. D., & Blundell, K. (2014). Cognitive reappraisal increases neuroendocrine reactivity to acute social stress and physical pain. *Psychoneuroendocrinology*, *49*(1), 69–78. https://doi.org/10.1016/j.psyneuen.2014.07.003

Dickerson, S. S., & Kemeny, M. E. (2004). Acute stressors and cortisol responses: A theoretical integration and synthesis of laboratory research. *Psychological Bulletin*, *130*(3), 355–391. https://doi.org/10.1037/0033-2909.130.3.355

Evers, C., Marijn Stok, F., & de Ridder, D. T. D. (2010). Feeding your feelings: Emotion regulation strategies and emotional eating. *Personality and Social Psychology Bulletin*, *36*(6), 792–804. https://doi.org/10.1177/0146167210371383

Foley, P., & Kirschbaum, C. (2010). Human hypothalamus-pituitary-adrenal axis responses to acute psychosocial stress in laboratory settings. *Neuroscience and Biobehavioral Reviews*, *35*(1), 91–96. https://doi.org/10.1016/j.neubiorev.2010.01.010

Folkman, S. (2013). Stress: Appraisal and coping. In M. D. Gellman & J. R. Turner (Eds.), *Encyclopedia of behavioral medicine* (pp. 1913–1915). New York, NY: Springer.

Gong, L., Li, W., Zhang, D., & Rost, D. H. (2016). Effects of emotion regulation strategies on anxiety during job interviews in Chinese college students. *Anxiety, Stress, & Coping*, *29*(3), 305–317. https://doi.org/10.1080/10615806.2015.1042462

Groesz, L. M., McCoy, S., Carl, J., Saslow, L., Stewart, J., Adler, N., … Epel, E. (2012). What is eating you? Stress and the drive to eat. *Appetite*, *58*(2), 717–721. https://doi.org/10.1016/j.appet.2011.11.028

Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, *74*(1), 224–237. https://doi.org/10.1037/0022-3514.74.1.224

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Grunberg, N. E. (1982). The effects of nicotine and cigarette smoking on food consumption and taste preferences. *Addictive Behaviors*, *7*(4), 317–331. https://doi.org/10.1016/0306-4603(82)90001-6

Grunberg, N. E., & Straub, R. O. (1992). The role of gender and taste class in the effects of stress on eating. *Health Psychology*, *11*(2), 97–100. https://doi.org/10.1037/0278-6133.11.2.97

Grunert, S. C. (1989). Ein Inventar zur Erfassung von Selbstaussagen zum Ernährungsverhalten [An inventory for the collection of self-reports regarding eating habits]. *Diagnostica*, *35*(2), 167–179.

Hess, U., & Blairy, S. (2001). Facial mimicry and emotional contagion to dynamic emotional facial expressions and their influence on decoding accuracy. *International Journal of Psychophysiology*, *40*(2), 129–141. https://doi.org/10.1016/S0167-8760(00)00161-6

Het, S., Schoofs, D., Rohleder, N., & Wolf, O. T. (2012). Stress-induced cortisol level elevations are associated with reduced negative affect after stress: Indications for a mood-buffering cortisol effect. *Psychosomatic Medicine*, *74*(1), 23–32. https://doi.org/10.1097/PSY.0b013e31823a4a25

Jamieson, J. P., Nock, M. K., & Mendes, W. B. (2012). Mind over matter: Reappraising arousal improves cardiovascular and cognitive responses to stress. *Journal of Experimental Psychology: General*, *141*(3), 417–422. https://doi.org/10.1037/a0025719

Jamieson, J. P., Nock, M. K., & Mendes, W. B. (2013). Changing the conceptualization of stress in social anxiety disorder: Affective

and physiological consequences. *Clinical Psychological Science*, *1*(4), 363–374. https://doi.org/10.7589/2012-06-150

Jehn, K. A. (1995). A multimethod examination of the benefits and detriments of intragroup conflict. *Administrative Science Quarterly*, *40*(2), 256–282. https://doi.org/10.2307/2393638

Jehn, K. A. (1997). A qualitative analysis of conflict types and dimensions in organizational groups. *Administrative Science Quarterly*, *42*(3), 530–557. https://doi.org/10.2307/2393737

John, O. P., & Gross, J. J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences, and life span development. *Journal of Personality*, *72*(6), 1301–1333. https://doi.org/10.1111/j.1467-6494.2004.00298.x

Kafetsios, K., Andriopoulos, P., & Papachiou, A. (2014). Relationship status moderates avoidant attachment differences in positive emotion decoding accuracy. *Personal Relationships*, *21*(2), 191–205. https://doi.org/10.1111/pere.12026

Kirschbaum, C., Kudielka, B. M., Gaab, J., Schommer, N. C., & Hellhammer, D. H. (1999). Impact of gender, menstrual cycle phase, and oral contraceptives on the activity of the hypothalamus-pituitary-adrenal axis. *Psychosomatic Medicine*, *61*(2), 154–62. https://doi.org/0033-3174/99/6102-0154

Lam, S., Dickerson, S. S., Zoccola, P. M., & Zaldivar, F. (2009). Emotion regulation and cortisol reactivity to a social-evaluative speech task. *Psychoneuroendocrinology*, *34*(9), 1355–1362. https://doi.org/10.1016/j.psyneuen.2009.04.006

Lehmann-Willenbrock, N., Grohmann, A., & Kauffeld, S. (2011). Task and relationship conflict at work: Construct validation of a German version of Jehn's Intragroup Conflict Scale. *European Journal of Psychological Assessment*, *27*(3), 171–178. https://doi.org/10.1027/1015-5759/a000064

Mauersberger, H., Hess, U., & Hoppe, A. (2018). Differential effects of task conflicts with and without relationship conflicts on performance: The mediating role of positive and negative affect. Manuscript submitted for publication.

Medina, F. J., Munduate, L., Dorado, M. A., Martínez, I., & Guerra, J. M. (2005). Types of intragroup conflict and affective reactions. *Journal of Managerial Psychology*, *20*(3/4), 219–230. https://doi.org/10.1108/02683940510589019

Narayanan, L., Menon, S., & Spector, P. E. (1999). Stress in the workplace: A comparison of gender and occupations. *Journal of Organizational Behavior*, *20*(1), 63–73. https://doi.org/10.1002/(sici)1099-1379(199901)20:1<63::aid-job873>3.3.co;2-a

Oliver, G., & Wardle, J. (1999). Perceived effects of stress on food choice. *Physiology and Behavior*, *66*(3), 511–515. https://doi.org/10.1016/S0031-9384(98)00322-9

Schulz-Hardt, S., Brodbeck, F. C., Mojzisch, A., Kerschreiter, R., & Frey, D. (2006). Group decision making in hidden profile situations: Dissent as a facilitator for decision quality. *Journal of Personality and Social Psychology*, *91*(6), 1080–1093. https://doi.org/10.1037/0022-3514.91.6.1080

Semmer, N. K., Jacobshagen, N., Meier, L. L., & Elfering, A. (2007). Occupational stress research: The "stress-as-offense-to-self" perspective. In J. Houdmont & S. McIntyre (Eds.), *Occupational health psychology: European perspectives on research, education and practice* (pp. 43–60). Castelo da Maia, Portugal: ISMAI Publishing.

Sheppes, G., & Gross, J. J. (2011). Is timing everything? Temporal considerations in emotion regulation. *Personality and Social Psychology Review*, *15*(4), 319–331. https://doi.org/10.1177/1088868310395778

Sheppes, G., & Meiran, N. (2008). Divergent cognitive costs for online forms of reappraisal and distraction. *Emotion*, *8*(6), 870–874. https://doi.org/10.1037/a0013711

Shiota, M. N., & Levenson, R. W. (2009). Effects of aging on experimentally instructed detached reappraisal, positive reappraisal, and emotional behavior suppression. *Psychology and Aging*, *24*(4), 890–900. https://doi.org/10.1037/a0017896

Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: Interpersonal Conflict at Work Scale, Organizational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory. *Journal of Occupational Health Psychology*, *3*(4), 356–367. https://doi.org/10.1037/1076-8998.3.4.356

Sproesser, G., Schupp, H. T., & Renner, B. (2014). The bright side of stress-induced eating: Eating more when stressed but less when pleased. *Psychological Science*, *25*(1), 58–65. https://doi.org/10.1177/0956797613494849

Svaldi, J., Caffier, D., & Tuschen-Caffier, B. (2010). Emotion suppression but not reappraisal increases desire to binge in women with binge eating disorder. *Psychotherapy and Psychosomatics*, *79*(3), 188–190. https://doi.org/10.1159/000296138

Taut, D., Renner, B., & Baban, A. (2012). Reappraise the situation but express your emotions: Impact of emotion regulation strategies on ad libitum food intake. *Frontiers in Psychology*, *3*, 359. https://doi.org/10.3389/fpsyg.2012.00359

Van Strien, T., Frijters, J. E. R., Bergers, G. P. A., & Defares, P. B. (1986). The Dutch Eating Behavior Questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behavior. *International Journal of Eating Disorders*, *5*(2), 295–315. https://doi.org/10.1002/1098-108X(198602)5:2<295::AID-EAT2260050209>3.0.CO;2-T

Webb, T. L., Miles, E., & Sheeran, P. (2012). Dealing with feeling: A meta-analysis of the effectiveness of strategies derived from the process model of emotion regulation. *Psychological Bulletin*, *138*(4), 775–808. https://doi.org/10.1037/a0027600

Zellner, D. A., Loaiza, S., Gonzalez, Z., Pita, J., Morales, J., Pecora, D., & Wolf, A. (2006). Food selection changes under stress. *Physiology and Behavior*, *87*(4), 789–793. https://doi.org/10.1016/j.physbeh.2006.01.014

SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

Appendix S1

How to cite this article: Mauersberger H, Hoppe A, Brockmann G, Hess U. Only reappraisers profit from reappraisal instructions: Effects of instructed and habitual reappraisal on stress responses during interpersonal conflicts. *Psychophysiology*. 2018;e13086. https://doi.org/10.1111/psyp.13086