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Psychology of Violence

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Angry Co-Rumination Increases Aggressive Behavior

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Objective: Angry rumination is the prolonged thinking about provoking events and their causes and consequences. Angry rumination increases aggression. Although people often ruminate individually, they also do so with others, which is known as co-rumination. Co-rumination about anger-inducing situations and its potential influence on aggressive behavior have not been studied. **Method:** Two experiments tested the hypothesis that communally reliving a provoking incident with another person via discussion would increase aggression. **Results:** In Experiment 1, co-rumination produced higher levels of aggression relative to both individual rumination and distraction. Experiment 2 replicated the aggression-augmenting effect of co-rumination for both interpersonal and intergroup contexts. When the provocation was at the intergroup level, being in the intergroup context led to more ingroup affiliative tendencies and hostile feelings than when the provocation was interpersonal in nature. Ingroup fusion occurred among participants who were insulted at the intergroup level and subsequently co-ruminated. **Conclusions:** The findings suggest that using angry co-rumination to process anger-inducing situations may lead to increased aggression. Future research could examine the processes through which angry co-rumination increases aggression.

Public Significance Statement

People sometimes rehash times when they were angry, which is known as angry rumination. Sometimes, they do this with other people. Our experiments showed that people who ruminated with other people were more aggressive than people who ruminated by themselves.

Keywords: co-rumination, aggression, individual rumination, angry rumination, intergroup

Angry rumination is the persistent thinking about personally meaningful anger-inducing events and situations (Denson, 2013; Sukhodolsky et al., 2001). Angry rumination is an emotion regulation strategy that can elicit aggressive behavior (Bushman et al., 2005; Denson et al., 2011; Pedersen et al., 2011). Previous research has examined the effect of angry rumination on aggressive behavior, but solely at the individual level. However, sometimes people co-ruminate with close others (e.g., friends, family, colleagues). According to a recent theoretical review,

Co-rumination is a social emotion regulation strategy whereby at least two people persevere on problems in a cyclical fashion, focus extensively on negative feelings, speculate about the causes and consequences of issues, and discuss parts of problems that are not well understood. (DiGiovanni et al., 2026, p. 1)

The present research is an experimental investigation into angry co-rumination. Specifically, participants were insulted and then directed to ruminate individually or in dyads. In two experiments,

we examined the effect of angry co-rumination on aggression and determined whether this effect differs in magnitude relative to individual rumination. We also investigated additional variables that might be affected by angry co-rumination, such as hostility and fusion with the ingroup.

Individual Angry Rumination

Engaging in angry rumination involves perseverative thinking about anger-inducing events, situations, and/or individuals (Denson, 2013; Sukhodolsky et al., 2001). A ruminating individual, for instance, may think about the reasons why they are angry (Rusting & Nolen-Hoeksema, 1998) or fantasize about taking revenge on an instigator (Denson et al., 2006; Poon & Wong, 2021). According to the general aggression model, person and situation factors (e.g., provocation, rumination) activate aggressive cognition, arousal, and anger (Anderson & Bushman, 2002). These “routes” to aggression affect how the situation is appraised and potentially reappraised. If one is

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unwilling or unable to reappraise, reactive aggression becomes likely.

Consistent with the general aggression model, ruminative thinking activates and maintains aggression-related affect (anger, hostility), arousal, and hostile cognition, which makes an individual aggressively primed or ready for engaging in aggressive behavior (Bushman et al., 2005; Denson, 2013; Pedersen et al., 2011). Being aggressively primed tends to augment the negative perceptions of and reactions to aversive stimuli, thereby increasing aggression (Bushman et al., 2005; Vasquez et al., 2013). In other words, rumination increases and/or maintains the factors that push an individual toward acting aggressively. In addition, because angry rumination is related to lower self-control and poorer executive functioning, it may impair the ability to reappraise the anger provocation in a nonaggressive manner, which leads to aggression (e.g., Denson et al., 2011; Ding et al., 2015; Jiang et al., 2025; Li et al., 2019), although one study did not find a significant relationship between angry rumination and reappraisal (Li et al., 2019). Many experimental, longitudinal, and cross-sectional studies from different countries now document the relationship between angry rumination at the individual level and aggression (Bushman et al., 2005; Camacho et al., 2021; Chatzimike-Levidi & Collard, 2023; Denson et al., 2009, 2011; Hou et al., 2024; Pedersen et al., 2011; Quan et al., 2021; Smith et al., 2016; Wang et al., 2020; Wen et al., 2024; Zhu et al., 2020, 2024).

In summary, angry rumination is an important cause of aggression. However, there are important reasons to expect that perseverative anger-related discussions in dyads can augment aggressive behavior to an even greater degree than individual rumination. In the next sections, we discuss this dyadic-level behavior and its influence on aggression.

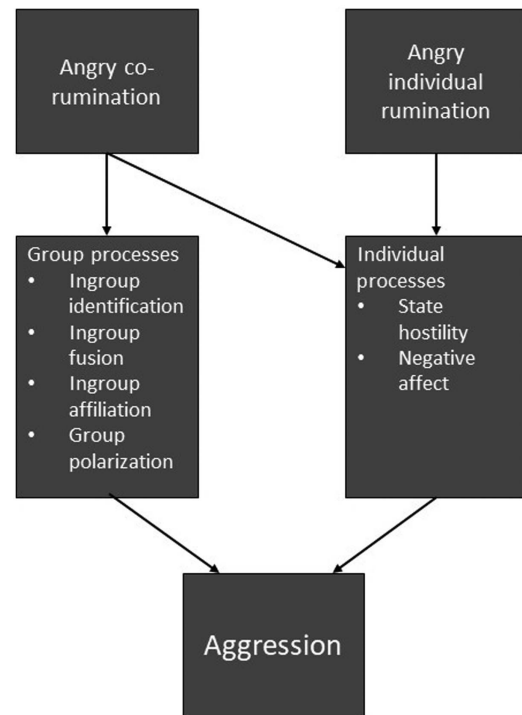
Angry Co-Rumination

When people struggle with difficult situations, problems, and emotions, it is human nature to seek out others. Negative emotional events seem particularly relevant in this regard. For instance, in one study, 81% of participants who experienced an intense anger episode and 84% who experienced an intense sadness episode reported sharing their feelings with someone within 5 days of the event (Brans et al., 2014). Co-rumination involves sharing negative emotional experiences but also perseverating on the problems, causes, and consequences of the episode. When the focus of co-rumination is on an anger-inducing event, we refer to this as *angry co-rumination*.

Most of the work on co-rumination has focused on how co-rumination augments depression and anxiety symptoms (Dong et al., 2025; Spendelov et al., 2017); however, it seems plausible that within the context of anger, angry co-rumination might exacerbate anger and hostility. Models of rumination such as the emotional cascades model (Selby et al., 2008) and multiple systems model of angry rumination (Denson, 2013) posit that rumination increases negative affect, which results in dysregulated behavior (e.g., aggression). It remains an open question as to whether angry co-rumination augments negative affect to a greater extent than individual rumination. If so, this increased negative affect could instigate greater aggression among angry co-ruminators than individual ruminators. Furthermore, because the present research is the first to compare angry co-rumination to individual angry rumination, we present an exploratory model of the pathways through which angry co-rumination might augment aggression (Figure 1). The model shows that both angry co-rumination

Figure 1

An Exploratory Model of Angry Co-Rumination Compared to Angry Individual Rumination



and individual rumination heighten hostility and negative affect within ruminating individuals. However, the intriguing prospect is that angry co-rumination may activate additional group-relevant processes that are not inherent in individual rumination. These exploratory processes may include increases in ingroup identification, fusion with the ingroup, desire for ingroup affiliation, and group polarization. We examined these possibilities in Experiment 2.

Interpersonal Versus Intergroup Context

Angry co-rumination is therefore distinct from its individual-level counterpart because it likely includes other people who may spread anger or steer the dyad or group in favor of retaliation following instigations. For instance, being in a group tends to make people more aggressive than individuals (Meier et al., 2007; Meier & Hinsz, 2004; Nawata, 2024). This behavior is an aggressive characteristic of the interindividual intergroup discontinuity effect (Insko et al., 1987), wherein individuals are more competitive when in groups than individually.

To more fully examine the role of intergroup processes in angry co-rumination, in the present research, participants were insulted in an intergroup context (Experiment 1) or either an intergroup or interpersonal context (Experiment 2). Specifically, the experimenter rudely told the dyad that they performed poorly on a cognitive task and that participants at the experimenter's university were superior to those of the participant's university (intergroup context). For the interpersonal context, the rude insult was still directed at the dyad, but without mention of group membership. We wished to determine whether angry co-rumination would impact aggression to the same

extent for each context (i.e., a main effect) or whether the effect of angry co-rumination on aggression would be limited to intergroup contexts (i.e., an interaction).

As just mentioned, we also examined four phenomena involving the ingroup–outgroup interactions that might be affected by angry co-rumination. These included increased group identification, ingroup fusion, desire for ingroup affiliation, and group polarization. We considered the possibility that an intergroup insult would heighten these group-based processes relative to an interpersonal provocation. Alternatively, angry co-rumination by itself may be sufficient to elicit a sense of “groupiness” (i.e., solidarity between the ruminators), which would manifest as a null effect of the context manipulation on aggression.

The Present Research

In two experiments, we examined the effects of angry co-rumination on aggression toward a provocateur in interpersonal and intergroup contexts. Experiment 1 assessed the relative impact of distraction (control), individual angry rumination, and angry co-rumination on aggression toward a provoking outgroup member. We expected that angry co-rumination would augment aggression to a greater degree than individual rumination, which in turn would augment aggression relative to distraction (Hypothesis 1). Experiment 2 replicated the effects of co-rumination on aggression and examined whether the aggression-augmenting effect of angry co-rumination is moderated by the context being intergroup or interpersonal. We expected that the intergroup context would elicit greater aggression than the interpersonal context (Hypothesis 2). Experiment 2 also examined potential group-level and individual-level outcomes of angry co-rumination on an exploratory basis. All research was approved by the Review Board for the Protection of Human Subjects of California State University, Long Beach (CSULB; Approval No. 493845-4). Data and R code for both experiments are available at https://osf.io/k9cht/overview?view_only=e0efa44e7ba44b3eab85b8a50ce6523e.

Experiment 1

In Experiment 1, as part of the provocation induction, participants and a confederate engaged in a bogus cognitive task. The experimenter, an outgroup member, subsequently insulted them and their ingroup based on their performance on the task. Following the provocation, participants in the individual rumination condition were asked to think and write about the events that had occurred in the experiment by themselves, and those in the co-rumination condition were asked to engage in an instant message exchange via computer with the confederate. Several of the comments from the confederate involved the insult from the experimenter. In the control condition, participants were asked to write about the layout of the university campus in order to distract them from the provocation. All participants subsequently had the opportunity to aggress against the outgroup provocateur. It was hypothesized that participants in both the individual and co-rumination conditions would aggress more against the experimenter than those in the distraction condition. In addition, we hypothesized that aggression would be higher in the co-rumination than in the individual rumination condition.

Method

Participants and Design

Participants were 187 college students, but 11 suspicious ones were excluded, leaving 176 (72% female; $M_{\text{age}} = 18.97$, $SD = 1.76$; 47% Latinx, 28% Asian, 16% Caucasian, 5% African American, 4% other). In a one-way between-subjects design, individuals were randomly assigned to one of three experimental conditions—co-rumination, individual rumination, or distraction (control). A power analysis in G*Power (Faul et al., 2007) revealed that 159 participants would provide power at .80 to detect a medium effect size ($f^2 = 0.25$) with $\alpha_{\text{two-tailed}} = .05$. The ostensible purpose of the study was to examine the relationship between personality, impression formation, and group performance.

Materials and Procedure

Provocation Procedure. Participants and a confederate were seated in a room by an experimenter who indicated that she was a PhD student from another university. After completing demographic and bogus personality items, the participant and the confederate completed a group task in which each person was asked to answer separate sets of anagrams but that the scores would be summed to produce an overall group score. The anagrams were very difficult (e.g., NVTNIMEREON = ENVIRONMENT).

When presenting the dyad’s combined score, the experimenter indicated that it was below average compared to a sample from her own university. She then harshly criticized the participant and confederate’s problem-solving ability and effort, stating that this portion of the experiment should be repeated. Then, in an exasperated and irritated tone, she added that it would waste her time, and they should just proceed with the rest of the study. This procedure reliably induces anger (e.g., Pedersen et al., 2000; Vasquez et al., 2005). The confederate was directed to another room for the remainder of the study.

Rumination Manipulation. Borrowing from previous rumination studies (e.g., Bushman et al., 2005; Denson et al., 2006, 2009), we next asked participants to complete an 18-min writing task in which they responded to nine different topics for 2 min each (e.g., what had occurred in the experiment up to that point, including their actions, feelings, and interactions with others). This task purportedly assessed their writing effectiveness. Participants were told that one among several different writing topics had been randomly chosen for them. Those in both the co-rumination and individual rumination conditions had identical topics. We intentionally chose these very general instructions to avoid potential demand characteristics that would arise had we directly instructed participants to write about the provoking feedback. Participants in the *individual rumination* condition then spent the next 18 min writing about the nine topics without interacting with anyone else. The 18-min writing time was constant across all three experimental conditions.

In contrast, those in *co-rumination* condition were informed that they would have the ability to communicate with their other dyad member (i.e., the confederate) via instant messaging on a computer as the two of them simultaneously worked on the same set of writing topics. The experimenter then indicated that the other dyad member (i.e., confederate) had been randomly selected to initiate the messages. During the course of the ensuing writing task, the confederate

sent an instant message on the computer to the participant in response to five of the nine topics. Each of these messages referred to the anagram task (i.e., the provocation induction) and expressed negative feelings about the event. For example, when participants needed to write about their thoughts concerning the anagram task that they performed as a dyad, the confederate stated the following to the participant via instant messaging: “Hey whatd you think of that anagram task? I thought it was pretty hard but the experimenter didnt have to be so rude about it.” The data from Experiment 1 verify the social exchange. Specifically, the confederate in the co-rumination condition sent instant messages to the participant in response to five of the nine writing prompts (specifically Prompts 2, 3, 5, 6, and 9). All individuals in the co-rumination condition responded to the confederate. At the end of each experiment session in Experiment 1, the experimenter copied and pasted all the written responses of the participant into a file. This process both confirmed the fact that they responded and the content of what they wrote. Furthermore, participants wrote an average of 95.16 words to the confederate summed across the five times the confederate communicated with them via instant messaging. Because the process we used in Experiment 1 was time- and labor-intensive and because we felt comfortable that the manipulation worked as intended in Experiment 1, we did not collect similar data in Experiment 2.

Participants in the *distraction* condition wrote about topics concerning the layout of their college campus. All participants were instructed not to worry about spelling or grammar.

Aggression Measure. Following prior research, participants were next given a form written on university letterhead, which explained that the Department of Psychology was soliciting input from participants in the hiring of student research assistants (Denson et al., 2011; Pedersen et al., 2000). It indicated that these were coveted positions in the department because they looked good on students’ resumes and offered a good salary. Allegedly, the department had received far more applications than they had positions and therefore would like student input in the hiring process. The form explained that the experimenter in the present study had applied for this position and participants were asked to evaluate this individual on five items ostensibly to be used in hiring decisions ($\alpha = .92$). One item assessed how strongly they recommended the experimenter for the position. The remaining items assessed their evaluation of the experimenter on four dimensions: likeable, friendly, competent, and intelligent (1 = *strongly agree*, 7 = *strongly disagree*). Participants were asked not to place their name on the evaluation. Furthermore, they placed the evaluation in an envelope and deposited it in a box to be picked up by a department staff member. The five items were averaged such that higher scores indicate greater indirect aggression.

Aggression is behavior intended to harm another person (e.g., Anderson & Bushman, 2002). By giving a negative evaluation, participants could intentionally harm the experimenter’s chance to obtain the highly coveted assistantship. This previously used measure (e.g., Pedersen et al., 2000) yields the same theoretically predicted results as physical measures of aggression such as loud blasts of noise and placing a person’s hand in painfully cold water (e.g., Bushman et al., 2005; Vasquez et al., 2005).

Rumination Manipulation Check. Participants next rated separately *how often* and *how strongly* they thought about the anagram task while they were writing task ($r = .83$, $p < .001$; 1 = *not at all*, 7 = *very often/very strongly*). The experimenter then debriefed participants and thanked them for their participation. This

manipulation check has shown good validity in previous experiments (e.g., Pedersen et al., 2011). Higher scores indicate greater rumination.

Prior to debriefing, participants also reported how much negative affect they experienced from the provocation (irritated, happy, angered or upset, pleased, annoyed; $\alpha = .84$; $M = 4.73$, $SD = 1.30$; 1 = *strongly disagree*, 7 = *strongly agree*) and negative affect during the writing task (eight items; e.g., “When performing the 20-minute writing task, I felt irritated”; $\alpha = .77$; $M = 3.51$, $SD = 1.18$). To determine if there was residual anger at the end of the experiment, participants completed the State Hostility Scale, which included anger-related statements (e.g., “I feel furious”; $\alpha = .94$; 1 = *strongly disagree*, 7 = *strongly agree*; $M = 64.84$, $SD = 18.11$).¹ The State Hostility Scale has shown good validity in prior research (e.g., Anderson, 1997). Higher scores indicate greater negative affect and state hostility, respectively.

Results

Manipulation Check

A one-way between-subjects analysis of variance indicated that the three conditions differed in the degree to which they thought about the provocation during the writing task, $F(2, 172) = 38.24$, $p < .0001$, $\eta^2 = .31$. Consistent with expectations, post hoc tests using Benjamini and Hochberg’s (1995) method showed that participants in both the co-rumination ($M = 4.19$, $SD = 1.66$) and individual ($M = 5.13$, $SD = 1.41$) rumination conditions reported thinking more about the provocation during the writing task than did those in the distraction condition ($M = 2.74$, $SD = 1.75$; both p values $< .001$), $d_s = 0.84$ and 1.51 , respectively. Participants in the individual rumination condition also reported thinking more about the provocation than participants in the co-rumination condition, $p = .004$, $d = 0.63$.

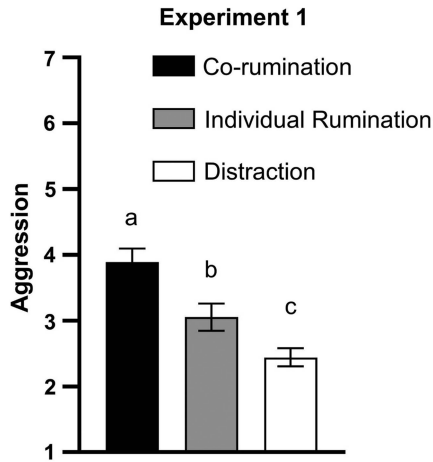
Aggression

A one-way between-subjects analysis of variance indicated that the experimental condition had an impact on aggression, $F(2, 172) = 12.39$, $p < .0001$, $\eta^2 = .13$ (Figure 2). Post hoc tests indicated that all conditions differed significantly from each other (all pairwise comparison p values $< .02$). Specifically, co-rumination ($M = 3.93$, $SD = 1.64$) produced the highest amount of aggression, followed by individual rumination ($M = 3.05$, $SD = 1.69$) and then distraction ($M = 2.46$, $SD = 1.03$; see Figure 2). Participants in the co-rumination condition were more aggressive than participants in the individual rumination condition, $p = .005$, $d = 0.53$. Thus, Hypothesis 1 was supported. Participants in the co-rumination condition and individual rumination condition were more aggressive than participants in the distraction condition, $d_s = 1.14$ and 0.42 , respectively.

As expected, there were no effects of the rumination manipulation on anger from the provocation, $F(1, 169) = 1.89$, $p = .15$, $\eta^2 = .02$; however, unexpectedly, there was also no effect of the manipulation on negative affect during rumination, $F(1, 167) = 0.39$, $p = .67$, $\eta^2 =$

¹ Participants also completed the Revenge Planning and Angry Rumination subscales of the Displaced Aggression Questionnaire (Denson et al., 2006) and the Narcissistic Personality Inventory (Raskin & Hall, 1979), but these did not show main effects or interact with the independent variables to affect aggression.

Figure 2
Aggressive Behavior as a Function of the Experimental Rumination Manipulations in Experiment 1



Note. Columns with different letters are significantly different from each other, $ps < .02$.

.004. At the end of the experiment, there were no differences in state hostility, $F(1, 144) = 0.02$, $p = .98$, $\eta^2 = .0003$.

Discussion

Replicating prior work, participants who ruminated by themselves demonstrated increased aggression relative to a distraction control condition (Bushman et al., 2005; Pedersen et al., 2011). Furthermore, the present study is the first to show that reliving a provocation with another person (i.e., angry co-rumination) produces significantly more subsequent aggressive behavior than individual rumination or distraction.

Experiment 2

Experiment 2 had three primary goals. First, we aimed to replicate the findings from Experiment 1. Second, Experiment 2 was designed to assess whether the context (i.e., *intergroup* vs. *interpersonal*) would moderate the aggression-augmenting effect of co-rumination. Third, Experiment 2 was designed to assess additional relevant variables that might be affected by co-rumination (e.g., ingroup fusion, group polarization) and whether these outcomes differ in intergroup and interpersonal contexts. Because the emphasis was on testing differences between the rumination types, we omitted the distraction condition from Experiment 2.

Method

Participants and Design

Participants were 356 college students, but 37 suspicious ones were excluded, leaving 319 (75.5% female; $M_{\text{age}} = 19.02$, $SD = 2.24$; 46% Latinx, 24.5% Asian, 18.5% Caucasian, 4% African American, 7% other). The experiment employed a 2 (type of rumination: co-rumination vs. individual) $\times$ 2 (context: intergroup vs. interpersonal) between-subjects design. A power analysis in G*Power (Faul et al., 2007) revealed that 309 participants would provide

power at .80 to detect a small-to-medium effect size ($f^2 = 0.16$) with $\alpha_{\text{two-tailed}} = .05$.

Materials and Procedure

The procedure for the *intergroup* condition was identical to Experiment 1's co-rumination and individual rumination conditions. The intergroup context (i.e., ingroup-outgroup categorization) was further made salient by the experimenter who said to the participant and the confederate, "You are eligible for this study because you are both CSULB students enrolled in PSY 100."

In the *interpersonal* condition, the anagram task was described as simply "another task" rather than a "group task." As in Experiment 1, in the intergroup condition, participants were told that the comparison group is comprised of students from the University of Southern California; however, in the interpersonal condition, no mention of university affiliation was provided in the interpersonal condition. The only change for the interpersonal condition was "We hope that you would score at about the same level of the previous sample of students" rather than University of Southern California students as the reference group. In each condition, the packet provided shows that the comparison group of students performed quite well on the task. As in Experiment 1, participants reported how often/strongly they thought about the provocation during rumination, $r(316) = .64$, $p < .0001$ (1 = *not at all*, 7 = *very often/strongly*). They also reported how much negative affect they experienced from the provocation ($\alpha = .84$; 1 = *strongly disagree*, 7 = *strongly agree*). The aggression measure was identical to Experiment 1 ($\alpha = .89$).

Secondary Dependent Variables. In order to examine the effects of the experimental manipulations in more depth, we included several theoretically relevant outcome variables. Specifically, we examined ingroup identification (adapted from Mael & Ashforth, 1992; six items; e.g., "I am very interested in what others think about CSULB"; 1 = *strongly disagree*, 7 = *strongly agree*; $\alpha = .78$; $M = 21.49$, $SD = 3.87$), ingroup fusion (single item; coded as percent of overlap with CSULB; $M = 49\%$, $SD = 27$; Swann et al., 2009), ingroup affiliation (three items; e.g., "I would feel closer to other CSULB students"; adapted from Spanovic et al., 2010; $\alpha = .67$; $M = 14.20$, $SD = 3.43$), and the two scales from Experiment 1: state hostility (32 items; e.g., "I feel furious"; $\alpha = .91$; $M = 65.13$, $SD = 15.26$) and negative affect during rumination (six items; e.g., "When performing the 20-minute writing task, I felt irritated"; $\alpha = .81$; $M = 21.06$, $SD = 6.79$). We also measured polarization toward the ingroup and outgroup by assessing positivity toward CSULB and the University of Southern California, respectively (1 = *exceptionally unfavorable*, 7 = *exceptionally favorable*), at the beginning of the experiment and again at the end. Time 1 scores were subtracted from Time 2 scores to create an index of polarization.² Participants also completed filler items assessing positivity toward several other universities.

Results

There were no differences between the conditions on the extent to which participants reported ruminating about the provocation (e.g.,

² Participants also completed the Revenge Planning and Angry Rumination subscales of the Displaced Aggression Questionnaire (Denson et al., 2006), but these did not show main effects or interact with the independent variables to affect aggression.

how often/strongly they thought about the anagram task), $ps > .53$. There were also no effects of the experimental manipulations on the extent to which participants reported experiencing negative affect from the provocation, $ps > .20$.

Aggression

A 2 (type of rumination: co-rumination vs. individual) $\times$ 2 (context: intergroup vs. interpersonal) between-subjects analysis of variance was performed. Replicating Experiment 1, there was a significant main effect for type of rumination, $F(1, 315) = 34.34, p < .0001, \eta_p^2 = .17$, wherein participants in the co-rumination condition ($M = 3.96, SD = 1.18$) displayed significantly more aggression than those who individually ruminated ($M = 2.81, SD = 1.39$), $d = 0.89$. Thus, Hypothesis 1 was supported. Neither the main effect of context, $F(1, 315) = 1.14, p = .286, \eta_p^2 = .003$, nor the interaction, $F(1, 315) = 0.24, p = .627, \eta_p^2 < .001$, was significant (Figure 3). Thus, Hypothesis 2 was not supported.

To more directly attempt to replicate the findings of Experiment 1, simple effects were performed. Results indicated that co-rumination produced more aggression than individual rumination in both the intergroup, $F(1, 152) = 41.18, p < .0001, \eta_p^2 = .21, d = 1.04$, and interpersonal conditions, $F(1, 163) = 24.80, p < .0001, \eta_p^2 = .13, d = 0.78$.

Secondary Dependent Variables

There were no main effects or 2 (type of rumination: co-rumination vs. individual) $\times$ 2 (context: intergroup vs. interpersonal) interactions on ingroup identification, negative affect during rumination, or group polarization (Table 1). However, there were main effects of context for ingroup affiliation, $F(1, 311) = 4.92, p = .027, \eta_p^2 = .02$, and state hostility, $F(1, 264) = 4.04, p = .045, \eta_p^2 = .02$. Specifically, there was greater affiliation in the intergroup condition ($M = 14.64, SD = 3.26$) than the interpersonal condition ($M = 13.79, SD = 3.54$), $d = 0.25$. Similarly, there was greater hostility at the end of the experiment in

the intergroup condition ($M = 67.20, SD = 16.10$) than in the interpersonal condition ($M = 63.15, SD = 14.19$), $d = 0.27$.

For ingroup fusion, there was a significant main effect of context, $F(1, 313) = 10.78, p = .001, \eta_p^2 = .01$, and a Type of Rumination $\times$ Context interaction, $F(1, 313) = 9.04, p = .003, \eta_p^2 = .03$. Simple-effects analyses showed that within the intergroup context condition, fusion was higher in the co-rumination condition ($M = 0.56, SD = 0.29$) than in the interpersonal condition ($M = 0.42, SD = 0.23$), $F(1, 161) = 5.62, p = .038, \eta^2 = .03, d = 0.31$. There were no differences in context in the individual rumination condition, $F(1, 152) = 3.65, p = .060, \eta^2 = .02$. The p values were adjusted for multiple comparisons using Benjamini and Hochberg's (1995) method.

Discussion

Experiment 2 replicated the finding from Experiment 1 that angry co-rumination elicited greater aggression than individual rumination. Furthermore, this increase in aggression occurred in both the intergroup and interpersonal contexts, suggesting that the aggression-augmenting effect of co-rumination can occur between individuals even if their group is not insulted. Although the context manipulation did not influence aggression, examination of the secondary dependent variables suggests that participants were sensitive to the manipulation. Relative to the interpersonal context, participants in the intergroup context condition reported greater affiliative tendencies with the ingroup as well as greater hostility. Ingroup fusion also occurred but was limited to participants who co-ruminated and were in the intergroup context condition.

General Discussion

The aim of the present research was to test the hypothesis that angry co-rumination would increase aggression to a greater extent than individual angry rumination. Two experiments confirmed this first hypothesis. In Experiment 1, participants who ruminated with another participant following a group-based insult were more aggressive than participants who ruminated individually and those who engaged in a distracting task. Experiment 2 replicated the finding that angry co-rumination increases aggression relative to individual rumination. Furthermore, Experiment 2 manipulated whether the context for the insult was interpersonal and intergroup in nature. The nature of the insult did not affect aggression, which did not support Hypothesis 2, but participants in the intergroup context condition showed heightened ingroup affiliation, hostility, and ingroup fusion.

The question as to how angry co-rumination increases aggression remains unclear. In both experiments, the rumination manipulation did not seem to influence self-reported negative affect during rumination, so increased negative affect seems an unlikely mechanism. Furthermore, we found that participants reported ruminating more in the individual rumination condition than the co-rumination condition in Experiment 1 and no differences in Experiment 2. Thus, it appears that the degree of rumination is not driving the augmented aggression in the co-rumination conditions that we observed in both experiments. These findings were unexpected, but suggest alternative possibilities for future research, which we discuss below.

One possibility for why the context manipulation did not affect aggression is that co-rumination may induce a subjective sense of "groupiness." That is, participants in the co-rumination conditions may have felt that they, along with the confederate, were a group

Figure 3
Aggressive Behavior as a Function of the Experimental Rumination Manipulations in Experiment 2

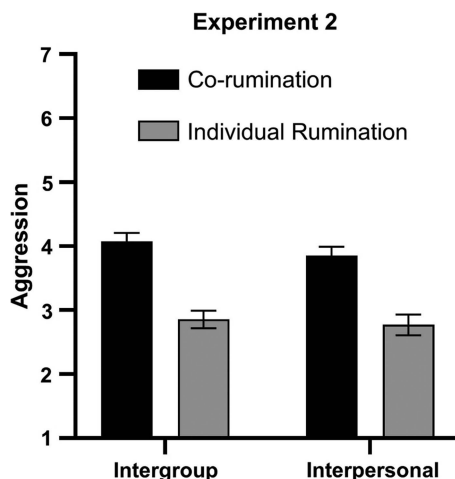


Table 1
Means and Standard Deviations for the Secondary Outcomes in Experiment 2

Variable	Co-rumination		Individual rumination	
	Intergroup	Interpersonal	Intergroup	Interpersonal
Aggression ^a	4.07 (1.16)	3.89 (1.18)	2.84 (1.23)	2.77 (1.52)
Ingroup identification	22.1 (3.54)	21.1 (4.31)	21.5 (3.45)	21.3 (4.12)
Ingroup fusion ^{b,c}	0.56 (0.29)	0.42 (0.24)	0.48 (0.25)	0.51 (0.27)
Ingroup affiliation ^b	14.6 (3.51)	13.4 (3.89)	14.7 (3.02)	14.1 (3.23)
State hostility ^b	69.3 (17.9)	64.6 (14.8)	64.7 (14.0)	62.3 (13.6)
Negative affect during rumination	22.3 (7.22)	20.5 (6.80)	21.3 (5.81)	20.2 (7.17)
Ingroup polarization ^d	-0.15 (0.64)	-0.04 (0.62)	-0.06 (0.58)	-0.02 (0.46)
Outgroup polarization ^d	0.46 (1.25)	0.28 (0.78)	0.18 (1.16)	0.14 (0.86)

^aMain effect of co-rumination versus individual rumination. ^bMain effect of intergroup versus interpersonal context. ^cSignificant interaction. ^dHigher scores = more negative attitude change from baseline.

unified in conflict against the rude experimenter, regardless of the intergroup or interpersonal insult. Although speculative, this notion seems like a plausible explanation for the null effect of context on aggression and the heightened aggression in the co-rumination conditions.

Relatedly, the sense of being part of a group may have facilitated perceptions of feeling stronger and, hence, better able to stand up against the provocateur. Thus, by forming a coalition in the co-rumination conditions, participants may have experienced enhanced strength and efficacy to retaliate against the rude experimenter. Indeed, coalitions engage in violence regularly (Macfarlan et al., 2014; Wrangham, 1999) and coalitional strength is a significant predictor of aggression, especially in males (Sell et al., 2016). Other work suggests that coalitional gossip, similar to that engaged in by the participants in the co-rumination condition, is an effective form of relational aggression (Hess, 2017). In sum, because being a part of a coalition shifts the balance of power in favor of the coalition, aggression may be a preferred strategy among angry co-ruminators to a greater extent than among individual ruminators.

Limitations

There were several limitations to the present research. One limitation is that our sample consisted of university students. It remains to be seen whether angry co-rumination has the same effect on aggression in the general population or forensic or offender populations. Replication in other relevant groups should be considered. For instance, groups characterized by sensitivity to intergroup threats, such as street gangs and people involved in intractable conflicts, may be especially affected by angry co-rumination. Nonetheless, we consider our findings useful in that many nonforensic people engage in angry co-rumination (e.g., colleagues co-ruminating about the new boss).

Although angry co-rumination has not been studied, other forms of co-rumination between two people bring them closer together (Rose, 2021; Rose et al., 2007). Co-ruminators, for instance, report increased relationship quality and report that their partners are responsive (DiGiovanni et al., 2025; Tudder et al., 2023). However, the downside of co-rumination is that it can exacerbate negative emotions. This phenomenon is referred to as the “trade-off hypothesis” (DiGiovanni et al., 2026; Rose, 2021; Rose et al., 2007). Another limitation is that we did not assess partner closeness or their perceived responsiveness. Thus, we were unable to determine whether the “trade-off hypothesis”

exists for angry co-rumination (DiGiovanni et al., 2026; Rose et al., 2007). That is, does angry co-rumination exacerbate aggression, but also make people feel closer to their partner? If participants do feel closer to their partners during co-rumination, it seems plausible that angry co-rumination could lead to a sense of feeling cohesive as a group or dyad, which could make people feel more protected or righteous when behaving aggressively. Indeed, threats from outgroups elicit increased trust, cohesiveness, and efficacy (Greenaway & Cruwys, 2019). Thus, future research could examine if interpersonal closeness is one of the mechanisms through which angry co-rumination affects aggression.

The present paradigm was also limited in that it was not possible to separate social interaction from the hostile content in the co-rumination condition. A future experiment might include an additional control condition in which participants in the individual rumination condition receive the same hostile statements from the confederate, but are not able to respond interactively. This would allow the social aspect of co-rumination to be isolated from the hostile content.

Future Research Directions

In the present experiments, we examined the effects of angry co-rumination on aggression directed against the provocateur. Other work shows that individual angry rumination can cause participants to respond aggressively toward undeserving others, known as displaced aggression (Bushman et al., 2005; Denson et al., 2006). It remains to be seen whether angry co-rumination has the same “spillover” effects to displaced aggression. For instance, it is possible that a man engaging in online co-rumination might lash out toward others in the home, especially if “triggered” by an innocuous comment from a family member (i.e., triggered displaced aggression; Miller et al., 2003).

Another possible avenue for future research is based on DiGiovanni et al.’s (2026) model of co-rumination. They specify different social processes involved in co-rumination that contribute to its effects: self-disclosure, social support, problem solving, and responsiveness. It remains to be seen how each of these might lead to the increased aggression we observed with angry co-rumination. For instance, the self-disclosure and social support given and received may increase empathy and reciprocity with one’s partner or group. These processes could lead to aggression through forming social bonds with the partner or group. In this manner, problem solving may be directed toward aggressive responding. Other research could manipulate the extent of

rumination by a confederate. If the confederate does not fully engage in rumination, co-rumination will not occur, and as a result, aggression should be diminished.

In their theory of co-rumination, DiGiovanni et al. (2026) apply Bronfenbrenner's (1977) ecological systems theory to the content of co-rumination. In short, what people angrily ruminate about with others may influence who they co-ruminate with. For instance, one may engage in co-rumination with a close friend about being the victim of romantic infidelity. However, they may seek out like-minded individuals to co-ruminate with about anger-inducing political issues. There is indeed suggestive evidence that people co-ruminate more about sociopolitical issues than personal issues as these topics are relevant to a broader swathe of the population than personal problems (DiGiovanni et al., 2026). That is, there are more people to co-ruminate with when the issue affects a lot of people. It remains to be seen whether this pattern holds for angry co-rumination.

Implications

The present research has implications for understanding the effects of co-rumination on aggression outside the laboratory. For instance, there are implications for digital environments as much angry co-rumination is perpetuated via the internet. For example, political enthusiasts and extremists often engage in online angry co-rumination with like-minded people (Martin & Vieaux, 2016; Rösner & Krämer, 2016). This type of angry co-rumination could lead not only to increased aggression directed at political rivals but may also be used as a tool to radicalize (Conway et al., 2019). This online angry co-rumination may prepare people for engaging in political violence. Future research could investigate this possibility.

We also wish to temper the negative outcomes associated with angry co-rumination by considering that angry co-rumination may also be used to advance meritorious goals. For instance, in the present research, angry co-ruminators likely sought to defend their self-esteem against a rude experimenter. By collectively discussing the antinormative behavior of the experimenter, angry co-ruminators were more likely to sanction the rude individual by giving them a poor evaluation. Future research may examine whether angry co-rumination can be extended to defense against unjustness in other domains and political systems. For instance, group-based angry rumination can increase positive collective action against discrimination (Borders & Wiley, 2020). Thus, the effects of angry co-rumination may be positive or negative, depending on the context.

Conclusions

The present research is the first to experimentally demonstrate that angry co-rumination increases aggression to a greater extent than individual angry rumination. This augmented aggression induced by angry co-rumination occurred both in intergroup and interpersonal contexts, suggesting a robust phenomenon. Future research could investigate the processes and outcomes that may be associated with angry co-rumination (e.g., trade-off effects, online anger, and displaced aggression).

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