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Erik C. Nook, Jessica L. Schleider, and Leah H. Somerville

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# A Linguistic Signature of Psychological Distancing in Emotion Regulation

Erik C. Nook, Jessica L. Schleider, and Leah H. Somerville  
Harvard University

Effective emotion regulation is critical for mental health and well-being, rendering insight into underlying mechanisms that facilitate this crucial skill invaluable. We combined principles of cognitive linguistics and basic affective science to test whether shifting components of one's language might foster effective emotion regulation. In particular, we explored bidirectional relations between emotion regulation and linguistic signatures of psychological distancing. In Study 1, we assessed whether people spontaneously distance their language (i.e., shift their word use to be less socially and temporally proximate) when regulating emotions. Participants transcribed their thoughts while either passively viewing or actively regulating their emotional responses to negative images. Regulation increased linguistic markers of social and temporal distance, and participants who showed greater linguistic distancing were more successful regulators. Study 2 reversed this relation and investigated whether distancing one's language spontaneously regulated one's emotions. Participants wrote about negative images either using psychologically "close" or "distant" language in physical, social, and temporal domains. All 3 domains of linguistic distancing spontaneously reduced negative affect. Distancing language also "bled" across domains (e.g., temporal distancing spontaneously produced social distancing). This suggests that distancing one's language in 1 domain (e.g., reducing use of present-tense verbs) produces shifts in deep representations of psychological distance that are measurable across domains (e.g., reduced use of the word "I"). Results extend understanding of language-emotion interactions and reveal novel strategies for reducing negative affect.

**Keywords:** emotion, emotion regulation, psychological distance, language

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Folk wisdom suggests that "getting some distance" from distressing situations can reduce negative emotions and help people cope. Scientific study supports this intuition: Imagining aversive images and upsetting social situations as happening far away or even from a third-person perspective reduces self-reported negative affect (Davis, Gross, & Ochsner, 2011; Kross, Ayduk, & Mischel, 2005). Such *psychological distancing* strategies also re-

duce biological indices of emotional arousal, including blood pressure and amygdala activity (Ayduk & Kross, 2010; Ochsner, Silvers, & Buhle, 2012). Consequently, psychological distance and negative affect share an inverse relationship: pushing bad things away—if only in our minds—attenuates their impact.

However, is it necessary to reimagine negative events as happening far away in order to feel better about them, or could simply shifting one's language to be more "distant" (i.e., engaging in *linguistic distancing*) have the same effect? Classic work in psycholinguistics demonstrates that psychological distance is embedded in our very language. The frequency of words that imply a focus on the temporal and social "present" (i.e., present-tense verbs and first-person singular pronouns, such as *I*, *me*, and *my*) naturally covary in written and spoken text (Mehl, Robbins, & Holleran, 2012; Pennebaker & King, 1999). English speakers also use the words *close* and *far* to describe distance across *physical*, *temporal*, and *social* domains. Americans are physically closer to New York than New Zealand, we're temporally closer to tomorrow than next century, and we're socially closer to our best friends than our bankers. These three domains of distance are conflated when people explicitly rate hypothetical situations (Fiedler, Jung, Wänke, & Alexopoulos, 2012; Yan, 2014) and when they respond to implicit tests (Bar-Anan, Liberman, Trope, & Algom, 2007; Tamir & Mitchell, 2011). Additionally, the inferior parietal lobule tracks shifts in distance along all three of these domains using the same neural code (Parkinson, Liu, & Wheatley, 2014). These findings suggest that the brain scaffolds representations of time, social familiarity, abstraction, and even probability onto the shared

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Erik C. Nook, Jessica L. Schleider, and Leah H. Somerville, Department of Psychology, Harvard University.

Portions of these data have been presented at annual meetings of the Society for Affective Science and the Society for Research on Psychopathology. Erik C. Nook and Jessica L. Schleider developed study designs. Erik C. Nook collected and analyzed data. Erik C. Nook, Jessica L. Schleider, and Leah H. Somerville interpreted results. Erik C. Nook drafted the manuscript, and Jessica L. Schleider and Leah H. Somerville provided critical revisions. All authors approved the final version of the manuscript for submission. The authors thank Daniela Feingold, Erin Guty, Amanda Heffernan, and Cambria Litsey for assistance with LIWC proofreading. This work was supported by a Harvard University small grant to Erik C. Nook, a National Science Foundation Graduate Research Fellowship (Grant DGE1144152) to Erik C. Nook, and a Harvard University startup grant to Leah H. Somerville.

Correspondence concerning this article should be addressed to Erik C. Nook, Department of Psychology, Harvard University, William James Hall, 33 Kirkland Street, Cambridge, MA 02138. E-mail: enook@g.harvard.edu

concept of physical space (Casasanto & Boroditsky, 2008; Maglio, Trope, & Liberman, 2013; Parkinson & Wheatley, 2015).

Taken together, if general psychological distance reduces negative affect and language encodes distance, might merely shifting one's language to be more distant help people regulate negative emotions? Although the relation between linguistic distance and emotion regulation has not been explored specifically, recent research suggests that increasing self-distance by talking to oneself using either the word *you* or one's own name (rather than the word *I*) facilitates self-regulation. For example, instead of saying "I can do this!" to yourself before a demanding task, saying "You can do this!" is associated with better performance on anagram tasks (Dolcos & Albarracín, 2014), better observer-rated performance and less self-reported anxiety when giving a stressful speech (Kross et al., 2014), and better executive function on a flanker task in 5-year-olds (White & Carlson, 2016). These studies demonstrate that shifting one's pronoun use can boost social and cognitive task performance and reduce negative emotions in stressful situations.

Additionally, researchers have found that linguistic measures of psychological distance contribute to the success of "expressive writing" tasks. In these tasks, participants write about upsetting experiences for a few minutes each day. Such prolonged verbal processing reduces negative affect and even boost immune functioning (Pennebaker & Chung, 2011). However, Park, Ayduk, and Kross (2016) found that expressive writing may be beneficial *because* it increases self-distancing and reduces participants' use of first-person singular pronouns. Campbell and Pennebaker (2003) also found that people benefit more from expressive writing if they flexibly vary their use of first-person singular pronouns from day to day. Hence, linguistic distancing appears to be an important component of the beneficial impact of expressive writing interventions.

Consequently, growing evidence suggests that linguistic measures of psychological distance—most particularly, modulating use of first-person singular pronouns, which are thought to track social distance—may facilitate adaptive cognitive and affective outcomes. However, several critical questions remain. First, what mechanisms explain why shifting one's pronouns provides these outcomes? Improved cognitive reappraisal may explain the relationship between linguistic distancing and improved cognitive and affective outcomes, but this mechanism has not been empirically investigated. Second, the aforementioned research focuses only on shifts in first-person singular pronouns, but could similar benefits emerge when people increase linguistic distance in other ways (e.g., by shifting verb tenses)? If so, this finding highlights a role for shifting psychological distance (not merely self-focus) in fostering adaptive regulation.

We explored these questions through two studies that use principles of cognitive linguistics to explore the role of linguistic distancing in emotion regulation. In Study 1, participants transcribed their thoughts while completing a canonical emotion regulation task. We investigated whether people spontaneously distanced their language when down-regulating negative emotions and whether people who were more effective at regulating their emotions distanced to a greater degree. In Study 2, we tested the reverse relationship. Participants wrote about negative images using language that either implied psychological proximity or psychological distance (along physical, social, and temporal domains). We assessed whether intentionally distancing one's lan-

guage spontaneously reduced negative affect. Together, these studies provide a focused test for bidirectional associations between linguistic signatures of psychological distancing and emotion regulation.

## Study 1

Research on emotion regulation focuses on a strategy called *cognitive reappraisal*, which involves reconstruing the meaning of a situation to make it less aversive (Gross, 1998, 2015). Researchers simulate this process in the laboratory by asking participants to either naturally respond to aversive images or to rethink the meaning of the images to make them less negative. Although this paradigm has granted unprecedented insight into the phenomenon of emotion regulation, we still know little about the specific cognitions that produce effective reappraisals because researchers have not conducted linguistic analyses of the thoughts and feelings people conjure when regulating.

We asked participants to transcribe their thoughts while regulating their emotions, and we assessed how emotion regulation impacted linguistic measures of psychological distance. Following extant work, we computed a measure of linguistic distancing that includes measures of social and temporal distance embedded in the use of the first-person singular pronouns (e.g., I, me, my) and present-tense verbs (e.g., look, feel). These parts of speech naturally cohere—along with additional grammatical classes such as articles (the, a, an), discrepancy words (e.g., would, could, should), and words of more than six letters—and are thought to represent a focus on the social and temporal "present" (Mehl et al., 2012; Pennebaker & King, 1999). Hence, this study assessed (a) whether people spontaneously distance their language along social and temporal domains when regulating their emotions, and (b) whether people who distance to a greater degree are more successful at regulating.

## Method

**Participants.** One hundred twenty Amazon Mechanical Turk (mTurk) participants completed Study 1. A power analysis based on a recent emotion regulation meta-analysis (Webb, Miles, & Sheeran, 2012) indicated that 63 participants were required to observe a within-subjects emotion regulation effect (estimated  $d = 0.36$ ) at  $p < .05$  and power of .80. We approximately doubled this sample size to ensure that we had ample power to test novel linguistic hypotheses. Only mTurk workers located in the United States who had at least a 95% task approval rate for previous human intelligence tasks were approved to participate in the study. Studies show that mTurk participants perform tasks similarly to laboratory participants (Buhrmester, Kwang, & Gosling, 2011; Hauser & Schwarz, 2016; Rand, 2012). Given the importance of excluding participants who fail to follow instructions (Fleischer, Mead, & Huang, 2015), we excluded eight participants who consistently progressed through trials without writing for a full 30 s and five who wrote about topics other than the images. Hence, 107 participants were included in analyses (27.10% male; 69.16% Caucasian, 1 did not disclose race; age range = 19–69,  $M = 35.78$ ,  $SD = 11.13$ ). Excluding participants did not alter the significance of results in either study except one supplementary analysis noted in Table S2 in the online supplemental materials.

All methods for both studies were approved by the Committee for Use of Human Subjects at Harvard University. Participants received \$3.50 for their time.

**Stimuli and procedure.** We adapted Ochsner, Bunge, Gross, & Gabrieli's (2002) emotion regulation paradigm for use on mTurk (Figure 1). Participants saw the cue word "LOOK" or the cue word "CHANGE" above an image for 30 s. Participants were instructed that the cue word "LOOK" meant that they should "just look at the picture and let yourself feel whatever that image makes you feel." Full instructions for both studies are provided in the online supplemental materials. The cue word "CHANGE" indicated that they should regulate their emotions by reappraising the meaning of the image (Gross, 1998, 2015). Critically, participants were not instructed to reappraise the image by imagining it as far away from them. Instead, they were instructed to reinterpret the meaning of the image to make it less negative (e.g., imagine that the objects are fake or that something good is about to happen). Participants transcribed what they were thinking and feeling about the image into a textbox that appeared below the image. The image automatically advanced after 30 s. Participants were instructed not to advance the screen before the requisite time had elapsed. Participants then rated how they were feeling on a 7-point scale (1 = *Not bad at all* to 7 = *Extremely bad*).

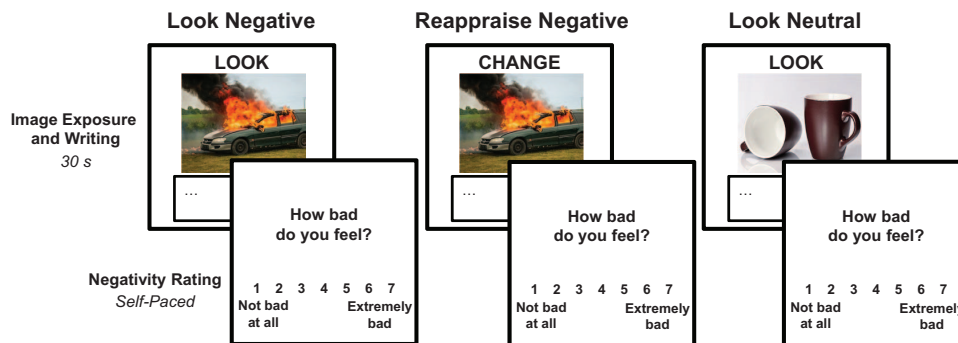
We assembled three lists of 20 images from the Open Affective Standardized Image Set (OASIS; Kurdi, Lozano, & Banaji, 2016). One list included only neutral images (normed valence ratings between 4 and 5 on a 1–9 scale where lower scores are more negative; valence:  $M = 4.40$ ,  $SD = 0.22$ ; arousal:  $M = 2.41$ ,  $SD = 0.38$ ). Neutral images were always paired with the "LOOK" instruction. The other two lists were both negative, and they were matched for valence (List A:  $M = 2.37$ ,  $SD = 0.42$ ; List B:  $M = 2.38$ ,  $SD = 0.42$ ; item analysis  $t(38) = -0.12$ ,  $p = .906$ ) and arousal (List A:  $M = 4.24$ ,  $SD = 0.56$ ; List B:  $M = 4.25$ ,  $SD = 0.50$ ;  $t(38) = -0.06$ ,  $p = .954$ ). Mapping of list and condition was counterbalanced across participants. This design divided trials into three conditions: (a) look negative, (b) reappraise negative, and (c) look neutral while ensuring that differences between the look negative and reappraise negative conditions were not due to stimuli differences. Participants completed 20 trials of each condition

and reported their age, gender, race, and annual family income at the end of the survey.

**Data processing.** We computed each participant's average negative affect rating for trials in each condition, and we used Pennebaker's Linguistic Inquiry and Word Count (LIWC) program to analyze text entries for each trial (Pennebaker, Chung, Ireland, Gonzales, & Booth, 2007). LIWC computes the percentage of words that fall within word categories. Qualitative and empirical investigations have related these categories to psychological phenomena of interest, such as affective state, temporal focus, and certain cognitive processes (Doré, Ort, Braverman, & Ochsner, 2015; Pennebaker et al., 2007). Following the LIWC manual, text entries were proofread for spelling before analysis. Proofreading did not affect the significance of results in either study.

We focused linguistic analyses on (a) negative affect words (e.g., hurt, nasty, worried, sad, crying, annoyed), (b) positive affect words (e.g., love, nice, sweet, happy, laughing, cute), and (c) a composite linguistic measure of psychological distancing (following Mehl et al., 2012). To compute this measure, we  $z$ -scored use of first-person singular pronouns (e.g., I, me, my), present-tense verbs, articles (the, a, an), discrepancy words (e.g., would, could, should), and words of more than six letters across trials. Factor analyses suggest that these linguistic variables track "verbal immediacy" (Pennebaker & King, 1999) and the resulting composite has been used in research on psychological distancing (Cohn, Mehl, & Pennebaker, 2004; Mehl et al., 2012). Consistent with these studies, we then reverse-scored the  $z$ -scored frequencies of first-person singular pronouns, present-tense verbs, and discrepancy words by multiplying them by  $-1$  and averaged these with the  $z$ -scored frequencies of articles and words of more than six letters for each trial. We averaged this measure of linguistic distancing across trials within each condition for each participant. Low linguistic distancing scores indicate writing that is personal, experiential, and focused on the here and now, whereas high linguistic distancing scores indicate language that is impersonal, abstract, and not focused on the personal or social present.

**Analyses.** Our first research question concerned how cognitive emotion regulation affects linguistic signatures of psycholog-



**Figure 1.** Study 1 task schematic. Participants wrote their thoughts and feelings about an image for 30 s before rating how bad they felt following image exposure. "LOOK," or "CHANGE" cues were presented above images to sort trials into look negative, reappraise negative, and look neutral conditions. In look negative and look neutral trials, participants wrote their natural thoughts and feelings in response to negative and neutral images, respectively. In reappraise negative trials, participants wrote their thoughts and feelings while reappraising the meaning of the image to make it less negative. See the online article for the color version of this figure.

ical distance. We used repeated-measures analyses of variance (ANOVAs) to test for significant differences across the three conditions. When significant effects emerged, we conducted follow-up paired-samples  $t$  tests to assess for differences between the reappraise negative condition and the other two conditions. We hypothesized that regulating negative emotions would be associated with reduced negative affect (i.e., reduced self-reported negative affect ratings, reduced use of negative affect words, and increased use of positive affect words) and increased linguistic distancing. To confirm that emotion regulation was associated with increases in specific aspects of social and temporal distancing, we present analyses of each subcomponent of the linguistic distancing measure in the online supplemental materials. Because it seemed unclear on the surface how the use of words of at least six letters would be associated with psychological distance, we tested and found that the significance of results remain identical when excluding this component from the psychological distancing measure.

We then investigated whether the tendency to use more psychologically distant language when regulating was associated with more successful emotion regulation. Following prior research (Wager, Davidson, Hughes, Lindquist, & Ochsner, 2008), we created a measure of *reappraisal success* for each participant by subtracting their average negative affect rating for images in the reappraise negative condition from their average rating for images in the look negative condition. We created analogous measures of how much each participant modulated their language when regulating their emotions by subtracting each participant's average frequency of negative affect words, positive affect words, and linguistic distancing words in the look negative condition from their average use in the reappraise

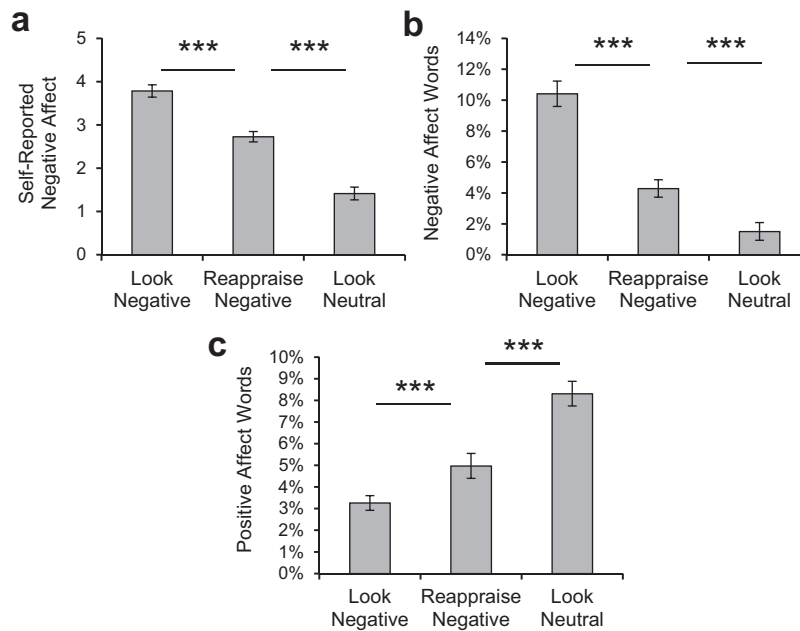
negative condition. More positive values indicate that participants showed a larger increase in their use of each word type when regulating. We used Pearson's correlations to test the hypotheses that higher reappraisal success scores would be associated with reduced use of negative affect words, increased use of positive affect words, and increased linguistic distancing. Lakens (2013) guided our report of effect sizes and confidence intervals (CIs), including the use of 90% CIs for ANOVAs and 95% CIs for  $t$  tests. As explained by Lakens (2013):

the 90% confidence interval (for ANOVAs) is reported due to the fact that an F-test is always a one-sided test, and the 90% confidence interval always excludes 0 when the F-test is statistically significant, while the 95% confidence interval does not. (p. 8)

We conducted a replication study in which we used these methods in a separate set of participants ( $N = 121$ ) and with a different set of images. Results from the replication study reproduced all main findings presented in figures below, bolstering confidence in our findings. Data for original and replication studies for both Study 1 and Study 2 can be found at <https://osf.io/jxhkt/>

## Results

**Self-reported negative affect ratings.** Participants reported less negative affect after regulating their emotions. Self-reported negative affect ratings differed significantly across conditions,  $F(2, 212) = 297.20, p < .001, \eta_p^2 = .74, 90\% \text{ CI} = [.69, .77]$ , as displayed in Figure 2a. Participants reported feeling less negative when writing about images in the reappraise negative condition ( $M = 2.73, SD = 1.05$ ) than when writing about images in the look



*Figure 2.* Study 1 affect results. Average (a) self-reported negative affect, (b) negative affect word use, and (c) positive affect word use for each condition. All plots show significant differences between the look negative and reappraise negative conditions, suggesting that regulation instructions reduced negative affect and increased positive affect. Error bars are 95% confidence intervals, adjusted for within-subjects comparisons following Morey (2008). \*\*\* $p < .001$ .

negative condition ( $M = 3.78$ ,  $SD = 1.18$ ),  $t(106) = -11.78$ ,  $p < .001$ , 95% CI of mean difference =  $[-1.23, -0.88]$ , Cohen's  $d = -0.95$ . Unsurprisingly, ratings for images in the reappraise negative condition were higher than ratings for images in the look neutral condition ( $M = 1.41$ ,  $SD = 0.54$ ),  $t(106) = 14.03$ ,  $p < .001$ , 95% CI =  $[1.13, 1.50]$ ,  $d = 1.57$ .

**Affect words.** Regulation was also associated with changes in the use of negative and positive affect words. The prevalence of negative affect terms differed significantly across conditions,  $F(2, 212) = 185.49$ ,  $p < .001$ ,  $\eta_p^2 = .64$ , 90% CI =  $[.57, .68]$ , as displayed in Figure 2b. Participants used fewer negative affect words in the reappraise negative condition ( $M = 4.29\%$ ,  $SD = 3.14$ ) than in the look negative condition ( $M = 10.41\%$ ,  $SD = 5.88$ ),  $t(106) = -11.54$ ,  $p < .001$ , 95% CI =  $[-7.18, -5.07]$ ,  $d = -1.30$ . Participants used more negative affect words in the reappraise negative condition than the look neutral condition ( $M = 1.51\%$ ,  $SD = 1.68$ ),  $t(106) = 8.67$ ,  $p < .001$ , 95% CI =  $[2.14, 3.41]$ ,  $d = 1.10$ . Similarly, the frequency of positive affect words differed significantly across conditions,  $F(2, 212) = 74.64$ ,  $p < .001$ ,  $\eta_p^2 = .41$ , 90% CI =  $[.33, .48]$ , as displayed in Figure 2c. Participants used more positive affect words in the reappraise negative condition ( $M = 4.97\%$ ,  $SD = 3.13$ ) than the look negative condition ( $M = 3.26\%$ ,  $SD = 2.08$ ),  $t(106) = 5.25$ ,  $p < .001$ , 95% CI =  $[1.07, 2.36]$ ,  $d = 0.64$ . Participants used fewer positive affect words in the reappraise negative condition than the look neutral condition ( $M = 8.31\%$ ,  $SD = 5.14$ ),  $t(106) = -7.30$ ,  $p < .001$ , 95% CI =  $[-4.24, -2.43]$ ,  $d = -0.78$ .

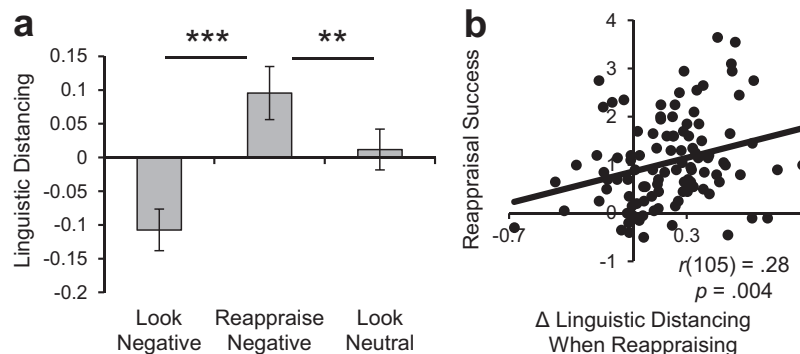
**Linguistic distancing.** Critically, participants spontaneously increased their use of words coding psychological distance when regulating emotions. The composite measure of linguistic distancing differed significantly across conditions,  $F(2, 212) = 35.97$ ,  $p < .001$ ,  $\eta_p^2 = .25$ , 90% CI =  $[.17, .33]$ , as displayed in Figure 3a. Participants' writing was more distanced in the reappraise negative condition ( $M = 0.10$ ,  $SD = 0.24$ ) than in the look negative condition ( $M = -0.11$ ,  $SD = 0.32$ ),  $t(106) = 7.71$ ,  $p < .001$ , 95% CI =  $[0.15, 0.26]$ ,  $d = 0.72$ . Additionally, writing was more distanced in the reappraise negative condition than in the look

neutral condition ( $M = 0.01$ ,  $SD = 0.33$ ),  $t(106) = 3.22$ ,  $p = .002$ , 95% CI =  $[0.03, 0.14]$ ,  $d = 0.29$ . This pattern existed for all components of the linguistic distancing variable except for words of more than six letters (see the online supplemental materials, Table S1). The significance of psychological distancing results does not change when the measure is computed without words of more than six letters, suggesting that it may not be central to a linguistic signature of emotion regulation.

**Relations between linguistic measures and reappraisal success.** Participants who increased their use of psychological distancing words when regulating were more successful at regulating their emotions than those who did not show this linguistic shift. We observed a significant correlation between reappraisal success and the extent to which participants increased their linguistic distance when regulating their emotions,  $r(105) = .28$ ,  $p = .004$ , 95% CI =  $[.09, .44]$ , as shown in Figure 3b. This correlation remained significant when a robust regression was used to ensure that the relation was not driven by influential points,  $b = 0.80$ ,  $p = .048$ . Significant or statistically trending correlations between reappraisal success and each component of the linguistic distancing measure emerged for use of first-person singular pronouns, present-tense verbs, and articles but not discrepancy words nor words of greater than six letters (see the online supplemental materials, Table S2). Greater reappraisal success was also associated with reduced use of negative affect words when regulating as compared with when responding naturally,  $r(105) = -.32$ ,  $p < .001$ . Reappraisal success was not associated with changes in the use of positive affect words,  $r(105) = .06$ ,  $p = .560$ .

## Study 2

Study 1 demonstrated that people spontaneously distance their language when regulating their emotions, and people who distance more strongly are better regulators. In particular, linguistic distancing appears to involve shifting away from the social and temporal present by reducing use of first-person singular pronouns



**Figure 3.** Study 1 linguistic distancing results. (a) Average use of linguistic distancing words (mean z-scored frequencies) in each condition. Participants used significantly more distancing words in the reappraise negative condition than the other conditions. (b) Scatterplot showing the relation between reappraisal success (the extent to which participants reduced their negative affect when regulating) and the extent to which participants increased their use of words encoding psychological distance when regulating. Participants who showed stronger linguistic distancing when regulating were more successful at regulating their emotions. Error bars are 95% confidence intervals, adjusted for within-subjects comparisons following Morey (2008). \*\*  $p < .01$ . \*\*\*  $p < .001$ .

and present-tense verbs. These results suggest that people spontaneously “take a step back” when regulating their emotions, and this increased psychological distance is evident in their language. Applying the principles of cognitive linguistics to a classic emotion regulation paradigm revealed the centrality of distancing as a cognitive mechanism that effectively and spontaneously facilitates effective emotion regulation.

However, at least two issues limit Study 1. First, because the spontaneous association between linguistic distancing and emotion regulation is correlational, one cannot infer that linguistic distancing is causally implicated in emotion regulation. Consequently, in Study 2 we tested the reverse relationship between linguistic distancing and emotion regulation: we experimentally manipulated distancing language and assessed whether intentionally distancing one’s language spontaneously down-regulates negative affect. Furthermore, we manipulated physical, social, and temporal distancing language separately to examine which—if any—of these components are integral to shifting affect. Second, we cannot be certain that the linguistic shifts observed in Study 1 truly track a dimension of psychological distance. Even though the correlation between first-person focus and present-tense focus suggests that social and temporal distance covary in our participants’ language, a more direct test of this hypothesis is warranted. Hence, our Study 2 design allows us to test whether intentionally shifting language in one domain leads to spontaneous shifts in other domains. Such “bleeding” of linguistic distancing across domains would support the notion that these measures track a deeper construct of psychological distance.

## Method

**Participants.** Two hundred forty-two mTurk participants completed Study 2. We again used a power analysis to determine sample size. The weakest effect of emotion regulation on distancing language in Study 1 was the effect on present-tense verbs ( $d = -0.47$ ). A power analysis suggested that 40 participants in each condition would detect a within-subjects effect of this size at  $p < .05$  and 80% power. Given that the effect of emotion regulation on distancing language may be stronger than the reverse direction (which we test in Study 2), we again doubled this recommendation for each of our three conditions, leading to a target sample size of 240. All participants were located in the United States, had at least a 95% task approval rate, and had not completed Study 1. We excluded 10 participants for timing non-compliance and five for writing about topics other than the images or for repeating task instructions in their responses. Analyses include  $N = 227$  participants (42.29% male, one did not disclose gender; 73.57% Caucasian, two did not disclose race; age range = 19–71,  $M = 36.02$ ,  $SD = 11.90$ ). Participants received \$3.50 for their time.

**Stimuli and procedure.** We adapted the Study 1 paradigm to assess whether shifting language from “psychologically close” words to “psychologically distant” words affects emotional experience. Participants saw a cue word above an image and wrote their thoughts and feelings about the image for 30 s. They then rated how they felt on the same scale used in Study 1. Critically, participants in this study were never instructed to regulate their emotions. Instead, participants were randomly assigned to one of three between-subjects conditions: (a) physical distance ( $N = 72$ ),

(b) social distance ( $N = 74$ ), and (c) temporal distance ( $N = 81$ ). Participants in the physical distance condition saw the cue word “HERE” above half of the images and “NOT HERE” above the other half of the images. “HERE” meant that they should write about the picture as if image was physically close to them, and “NOT HERE” indicated that they should write as if it was happening far away from them. Participants in the social distance condition saw the cue words “I” or “NOT I” instructing them to either use the word “I” or not use “I” while writing about each image. Participants in the temporal distance condition saw the cue words “NOW” and “NOT NOW.” Participants were to only use the present tense when writing about images paired with the “NOW” cue and not use the present tense (i.e., use either past or future tense) for the “NOT NOW” cue.

This effectively produced a 2 [distance: close versus distant]  $\times$  3 [domain: physical versus social versus temporal] mixed design, where distance was manipulated within subjects, and domain was manipulated between subjects. We used the same two lists of negative images as in Study 1 and counterbalanced list assignment to close versus distant conditions across participants. Participants completed the demographic questionnaire at the end of the study.

**Data processing.** We again proofread text entries and analyzed them using LIWC. We computed each participant’s average self-reported negative affect, use of negative and positive affect words, use of first-person singular pronouns, use of present-tense verbs, and linguistic distancing for each condition. Because we instructed participants to shift specific components of the distancing language construct, we focus our analyses on these components (i.e., first-person singular pronouns and present-tense verbs) in the main text and present analyses of the composite linguistic distancing measure in the online supplemental materials.

**Analyses.** The first analysis assessed whether using distant language spontaneously decreased negative affect. Hence, we analyzed self-reported negative affect using a 2 [distance]  $\times$  3 [domain] mixed ANOVA. We hypothesized that self-reported negative affect would be lower in the distant (i.e., NOT HERE, NOT I, and NOT NOW) conditions compared to the close (i.e., HERE, I, and NOW) conditions. This analysis also allowed us to compare the strength of the three domains of linguistic distancing. We analyzed frequencies of negative and positive affect words using 2  $\times$  3 ANOVAs. Because shifting linguistic distance did not have a main effect on the use of either negative or positive affect words,  $ps > .44$ , we report results of these analyses in the online supplemental materials.

We then conducted 2  $\times$  3 ANOVAs on each linguistic variable of interest (i.e., use of negative affect words, positive affect words, first-person singular pronouns, and present-tense verbs). When significant effects emerged, we used paired-samples  $t$  tests to determine whether each linguistic variable differed significantly between close and distant instructions of each domain. This allowed us to test whether participants followed instructions (i.e., reduced first-person singular pronouns in the social distance condition and reduced present-tense verbs in the temporal distance condition). We present these analyses as a set of manipulation checks in the online supplemental materials. However, we also used this analysis to test whether intentionally shifting one type of psychological distancing language would “bleed” into spontaneous shifts in linguistic distance across other domains. Based on prior work (Casasanto & Boroditsky, 2008; Maglio et al., 2013; Parkin-

son et al., 2014; Pennebaker & King, 1999), we hypothesized that linguistic markers of social and temporal distance (i.e., first-person singular pronouns and present-tense verbs) would shift across all three domains of linguistic distancing. See the online supplemental materials, Table S3, for means and standard deviations of dependent variables in all conditions (e.g., NOT I vs. I). Again, a replication of this study ( $N = 247$ ) using identical methods but a different set of images reproduced all primary findings presented in figures below.

## Results

**Self-reported negative affect ratings.** Writing about images using psychologically distant language reduced self-reported negative affect. A main effect of distance revealed that participants reported more negative affect after writing about images in the close condition ( $M = 3.86$ ,  $SD = 1.24$ ) than in the distant condition ( $M = 3.45$ ,  $SD = 1.10$ ),  $F(1, 224) = 65.25$ ,  $p < .001$ ,  $\eta_p^2 = .23$ , 90% CI = [.15, .30], as displayed in Figure 4. As hypothesized, shifting from close to distant language reduced negative affect for all three distancing domains, physical:  $t(71) = -7.72$ ,  $p < .001$ , 95% CI = [-1.05, -0.62],  $d = -0.77$ ; social:  $t(73) = -2.81$ ,  $p = .006$ , 95% CI = [-0.47, -0.08],  $d = -0.22$ ; temporal:  $t(80) = -2.50$ ,  $p = .014$ , 95% CI = [-0.31, -0.04],  $d = -0.16$ . There was no main effect of domain on negative affect,  $F(2, 224) = 2.27$ ,  $p = .105$ ,  $\eta_p^2 = .02$ , 90% CI = [.00, .05], but there was a significant interaction between distance and domain,  $F(2, 224) = 15.02$ ,  $p < .001$ ,  $\eta_p^2 = .12$ , 90% CI = [.06, .18]. The interaction indicates that some types of distancing are more effective at down-regulating negative affect than others. Effect sizes suggest that physical distancing is more effective than social distancing, which is more effective than temporal distancing.

**Psychological distance words: cross-domain effects.** Participants shifted their use of both social and temporal distancing language even in conditions when they weren't explicitly instructed to do so. Participants spontaneously reduced their use of first-person singular pronouns (e.g., I) both when instructed to use physically distant language,  $t(71) = -8.89$ ,  $p < .001$ , 95% CI =

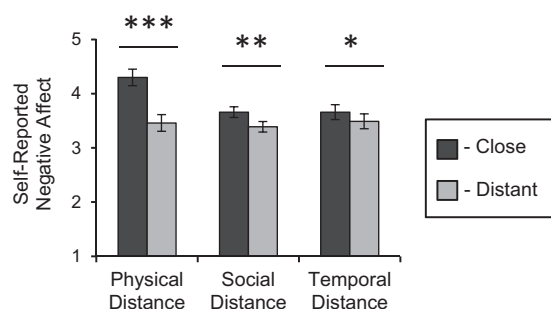
[-4.26, -2.70],  $d = -0.94$ , and when instructed to use temporally distant language,  $t(80) = -3.30$ ,  $p = .001$ , 95% CI = [-1.26, -0.31],  $d = -0.21$ , as displayed in Figure 5a, even though they were not instructed to change their use of *I* in these conditions. Similar cross-domain effects occurred for the use of present-tense verbs. Participants used fewer present-tense verbs when distancing physically,  $t(71) = -3.50$ ,  $p < .001$ , 95% CI = [-1.84, -0.50],  $d = -0.24$ , and socially,  $t(73) = -5.90$ ,  $p < .001$ , 95% CI = [-3.53, -1.75],  $d = -0.62$ , as displayed in Figure 5b. Additionally, the composite measure of linguistic distancing revealed increased distancing in the physical distance condition, even though participants in that condition were not instructed to change their use of any specific component of this construct (see the online supplemental materials).

## Discussion

In two studies, we found bidirectional relations between distancing language and emotion regulation. In Study 1, participants spontaneously reduced their use of words that focus on the social and temporal present when instructed to regulate their emotions. Additionally, participants who showed stronger linguistic distancing while regulating were more successful at regulating emotions. Data from Study 2 support a causal role for linguistic distancing in emotion regulation, as participants reported a spontaneous reduction of negative affect when they merely used psychologically distant, rather than psychologically close, language when writing about negative images. Further, linguistic measures of social and temporal distancing bled across all three distancing domains, supporting the notion that these word types track an underlying dimension of psychological distance.

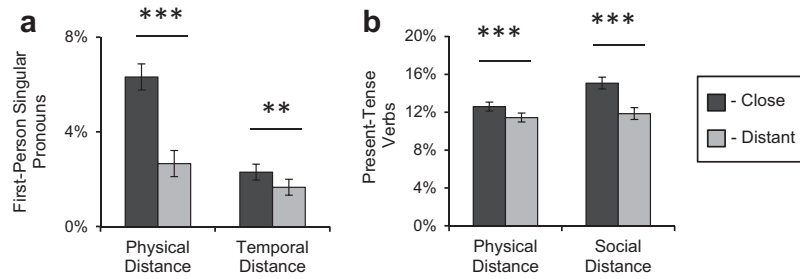
These results unite the idea that distancing oneself from aversive stimuli reduces its negative impact (Kross & Ayduk, 2011) with the idea that our mind collapses three domains of psychological distance into a common neural and linguistic code (Casasanto & Boroditsky, 2008; Maglio et al., 2013; Parkinson et al., 2014; Pennebaker & King, 1999). This union highlights the notion that language may constitute a primary target for both measuring and manipulating psychological distance and cognitive emotion regulation. Although there has been immense interest in how language shapes emotion (Lindquist, Satpute, & Gendron, 2015) and how emotion regulation shapes mental health (Aldao, Nolen-Hoeksema, & Schweizer, 2010), less attention has been paid to the role of psychological distance. Consequently, these results reveal that further insight into emotion regulation can be gained using cognitive linguistic principles. These findings likewise extend knowledge of linguistic distance by demonstrating its important impact on critical emotion and emotion regulation processes.

These results offer mechanistic insight into the findings of recent work on language and emotion. For instance, it is possible that using the pronoun *you* or one's own name instead of *I* during self-talk improves cognitive task performance, reduces anxiety, improves performance on a stressful speech task, and facilitates the therapeutic impact of expressive writing because it facilitates adaptive cognitive reappraisal (Dolcos & Albarracín, 2014; Kross et al., 2014; Park et al., 2016; White & Carlson, 2016). These studies have shown that changes in one's attitudes and self-distance may mediate the relation between linguistic distancing and adaptive outcomes in these tasks, but the potential role of



**Figure 4.** Study 2 self-reported negative affect results. Dark gray bars represent average negative affect ratings when participants wrote about pictures using words tracking psychological proximity (close condition). Light gray bars represent average negative affect ratings when participants used words tracking psychological distance (distant condition). Using more distant language decreased negative affect in all three distancing domains. Error bars are 95% confidence intervals, adjusted for within-subjects comparisons following Morey (2008). \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .





*Figure 5.* Study 2 distancing language cross-domain results. Average (a) first-person singular pronoun use for the physical distance and temporal distance conditions (i.e., the conditions for which participants were not explicitly instructed to change their use of first-person singular pronouns). (b) Present-tense verb use for the physical distance and social distance conditions (i.e., the conditions for which participants were not explicitly instructed to change their use of present-tense verbs). Dark gray bars represent averages when participants wrote about pictures using words tracking psychological proximity (close conditions), and light gray bars represent averages when participants used words tracking psychological distance (distant conditions). Error bars are 95% confidence intervals, adjusted for within-subjects comparisons following Morey (2008). \*\*  $p < .01$ . \*\*\*  $p < .001$ .

emotion regulation remains unexplored. This constitutes an exciting avenue of future research, given the pervasive impact of successful emotion regulation on well-being.

Additionally, scholars have recently shown that affect and distance are inversely related in online discussions of national tragedies, a pattern that converges with what we demonstrated in the laboratory using a canonical reappraisal task. For instance, Doré et al. (2015) found that temporal and spatial distance from a national tragedy reduced the use of affective words in Twitter posts. This finding suggests that *actual* spatial and temporal distance are associated with reduced negative affect, and our findings extend this research by demonstrating that simply shifting our use of words that imply greater distance has the same effect. Additionally, Cohn et al. (2004) found that bloggers' language immediately became more psychologically distant following the September 11th attacks. A speculative interpretation of these results in light of our findings may be that these scholars captured a real-world instance in which individuals distanced their language to make sense of and regulate intense negative emotions following tragedies. Following results presented here, we encourage further work on the underlying mechanisms that connect shifts in linguistic distancing to other real-world affective phenomena.

One potential concern with work on linguistic distancing is the possibility that greater distancing reduces negative affect only because it helps people *avoid* their stressors, rather than effectively process them. Kross and colleagues have repeatedly investigated this question, and they consistently fail to find evidence that self-distancing reduces negative affect because it promotes avoidance, suppression, or distraction. Instead they find that distancing promotes positive reconstrual of stressors, which provides long-term benefits (Kross & Ayduk, 2008; Kross, Gard, Deldin, Clifton, & Ayduk, 2012). Nonetheless, this possibility merits further investigation, potentially using longitudinal designs to assess whether linguistic distancing produces prolonged regulatory benefits.

Another avenue for future research involves investigating whether shifts in distancing language constitute or produce the reappraisals that underlie emotion regulation. On the one hand, language and thought may be inseparable—implying that shifting

one's language produces *de facto* shifts in one's appraisals—and so linguistic distancing *constitutes* reappraisal. On the other hand, language and cognition may be separable phenomena, implying that linguistic distancing may precede cognitive reappraisal. However, cognitive linguists have long debated whether language and thought are identical or separable mental phenomena (Harris, 2006). A second unexplored facet of our work involves the level of awareness participants have concerning the relationship between linguistic distancing and emotion regulation. Future research could investigate whether awareness of linguistic effects on emotion regulation moderates the effects demonstrated here.

Future research should also clarify the implications of this work for clinical domains. Because impaired emotion regulation is central to many forms of psychopathology (Aldao et al., 2010; Gross & Jazaieri, 2014), could merely shifting patients' language to be less self- or present-focused help them gain relief from negative affect or help them interpret experiences more positively? Self-distancing strategies help people with major depression and social anxiety symptoms reduce negative affect and cope with aversive situations (Kross et al., 2014, 2012). Hence, linguistic distancing may indeed benefit these populations.

However, this approach may be somewhat counterintuitive, as depression and anxiety are characterized by excessive rumination (revisiting painful past memories and searching for their causes) and/or worrying (imagining catastrophic future outcomes and searching for ways to prevent them; Kircanski, Thompson, Sorenson, Sherdell, & Gotlib, 2015). These modes of thought seem to involve *excessive* distancing, as patients are overly focused on either the past or the future. Why, then, would gaining greater distance from the present aid populations who seem chronically hyper-distanced from it? This question begs future research, but we offer two possibilities worth investigating. First, it may be vital for people to be flexible in their temporal focus. Although distancing is helpful when one tries to regulate one's emotion, chronic distance may actually impair functioning (cf., Campbell & Pennebaker, 2003). Second, it may be the case that people with anxiety and depression are not overly distanced but are rather pulling the future and the past too close to the present. Our own data suggest that dragging painful or terrifying experiences closer than they

ought to be increases their impact. Hence, seeing the source of one's rumination or worry as far away may bring relief. Although speculative, these possibilities merit further investigation, especially given that they represent the fruitful union of cognitive linguistics, affective science, and clinical psychology. If simply increasing one's linguistic distance does indeed facilitate effective emotion regulation in people with psychopathology, this technique could improve the efficacy of psychotherapeutic treatments for affective psychopathology.

In conclusion, identifying a linguistic signature of psychological distance in emotion regulation offers a new tool for assessing and manipulating psychological distance and emotional states, suggests new directions for theoretical understanding of language-emotion interactions, and prompts new ways for understanding and potentially treating affective psychopathology.

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