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Rebecca J. North, Rachel L. Meyerson, Danielle N. Brown and Charles J. Holahan  
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**What is This?**

# The Language of Psychological Change: Decoding an Expressive Writing Paradigm

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## Abstract

This study uses linguistic analysis to investigate psychological changes associated with an emotion regulation strategy integrating psychological acceptance and positive reappraisal, as compared to two established strategies. Two hundred and sixty-nine undergraduate participants wrote for 4 consecutive days, 20 minutes each day, about the biggest problem in their lives and were randomly assigned to use one of three emotion regulation strategies: (a) acceptance + positive reappraisal, (2) emotional disclosure, or (3) positive reappraisal. Linguistic analyses were conducted to examine changes in attentional focus and insightful and causal thinking in the writings. Results indicated that participants who integrated acceptance and positive reappraisal wrote less about the past and more about the future, and used more insight words, over the course of writing relative to the other two conditions. In addition, they used a decreasing amount of first-person singular pronouns (e.g., “I”) and increased more in their use of first-person plural pronouns (e.g., “we”). Implications of these language findings for understanding underlying psychological changes are discussed.

## Keywords

acceptance, emotional disclosure, positive reappraisal, expressive writing, language

A growing body of empirical literature demonstrates that emotional disclosure through expressive writing, typically consisting of several brief writing sessions in which participants write about their thoughts and feelings in an uninhibited way (Fratraro, 2006), has advantageous effects on physical health (e.g., Pennebaker, 1997; Smyth &

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Pennebaker, 2008; Stanton et al., 2000) and emotional well-being (for a review, see Frattaroli, 2006). Linguistic analysis allows researchers to use language as a tool for providing insight into psychological processes that occur during writing (Tausczik & Pennebaker, 2010). The present study uses linguistic analysis, and more specifically Linguistic Inquiry and Word Count (LIWC; Pennebaker, Francis, & Booth, 2001), to examine psychological changes associated with writing about the biggest problem in a person's life using an emotion regulation strategy integrating psychological acceptance and positive reappraisal, as compared to two established strategies: emotional disclosure and positive reappraisal alone.

There is an abundance of literature demonstrating the positive impact of emotional disclosure and positive reappraisal on psychological outcomes. A recent meta-analysis examining expressive writing revealed that emotional disclosure leads to improved psychological health, including decreases in distress, depressive symptoms, anger, and anxiety and increases in subjective well-being (Frattaroli, 2006). For example, patients coping with breast cancer experienced a decrease in distress and an increase in vigor through emotional disclosure (Stanton et al., 2000). Positive reappraisal, also called cognitive reappraisal, involves reinterpreting potentially negative situations in positive ways and has been associated with improved psychological well-being in many studies (e.g., Gross, 2008; Gross & John, 2003; McCrae & Costa, 1986; Richards, Butler, & Gross, 2003). Similarly, an experimental writing study demonstrated that health benefits were associated with having individuals write about perceived benefits resulting from a traumatic event (King & Miner, 2000), and more broadly, previous research has shown positive effects following negative life experiences when people derive positive meaning from the experience (Folkman, 1997, 2008). Although both emotional disclosure and positive reappraisal have demonstrated benefits in multiple studies, they are somewhat contradictory strategies for relating to negative phenomena: One encourages people to openly express all emotions and the other encourages people to reinterpret potentially negative situations in more positive ways.

The acceptance + positive reappraisal strategy, combining psychological acceptance and positive reappraisal, seeks to draw on the benefits of the two established emotion regulation strategies, emotional disclosure and positive reappraisal, creating a third, integrative way of relating to negative phenomena. The first part of the strategy, acceptance, is inspired by the standard expressive writing paradigm (Pennebaker, 1997) that encourages emotional disclosure by instructing individuals to let go and express all emotions. It modifies the standard expressive writing paradigm, however, by explicitly guiding individuals to write about and thereby acknowledge the negative emotions associated with a problem. This change draws on research demonstrating the benefits of psychological acceptance, a strategy that has gained significant attention in clinical psychology and has been defined as the willingness to experience all emotions without trying to change, avoid, or control them (Hayes, 1994). Acceptance-based strategies have been associated with positive psychological change in a range of conditions (e.g., depression, social phobia, and work stress; Hayes et al., 2006). The first part of the strategy modified the standard paradigm of emotional disclosure because many people have difficulty allowing themselves to express negative emotions and

may need to be given explicit permission to do so (Ben-Shahar, 2007). The second part of the integrative strategy, positive reappraisal, applies empirical evidence demonstrating the efficacy of positive reappraisal to the realm of expressive writing by instructing individuals to see their problem in a positive light and write only about the positive aspects of the problem.

The resulting paradigm integrating acceptance and positive reappraisal is similar to certain theoretical models in clinical psychology, like Acceptance and Commitment Therapy (Hayes, Strosahl, & Wilson, 1999) and Dialectical Behavior Therapy (Linehan, 1994). In both interventions, clients are taught to accept themselves and their feelings while making positive changes to improve their lives (Baer, 2003; Hayes et al., 1999). Although emerging evidence has demonstrated the positive impact of these dialectical approaches in therapy, this paradigm had not been examined as an emotion regulation strategy for approaching everyday negative emotions in nonclinical contexts. However, a recent experimental study (North, Pai, Hixon, & Holahan, 2011) tested a strategy integrating acceptance and positive reappraisal in an expressive writing paradigm and compared it to the established strategies of emotional disclosure (i.e., standard expressive writing paradigm) and positive reappraisal. The study found that the integrative strategy led to better emotional well-being at postintervention, controlling for preintervention, including greater happiness and positive emotions, marginally fewer negative emotions, and greater overall psychological acceptance.

The present study extends this previous research by using language to examine the psychological changes associated with a strategy integrating acceptance and positive reappraisal. Examining language use over time in the context of expressive writing studies is important because language use provides a window into people's thought processes (Tausczik & Pennebaker, 2010). Furthermore, examining changes in language use over time, as opposed to overall language use, in the context of expressive writing studies is important because change in language use signals a change in the way people think, and a change in thinking could be a prerequisite to benefiting from expressive writing, much like a change in thinking is necessary if people are to benefit from clinical interventions (Campbell & Pennebaker, 2003). More generally, analyzing changes in language across writings allows researchers to go beyond self-report questionnaires to observe psychological changes, including changes in cognitive and emotional processes.

## **Cognitive Processes**

In considering which cognitive processes would be meaningful to investigate in an examination of psychological changes resulting from this integrative emotion regulation strategy, attentional processes seem to be highly germane. Much previous research has demonstrated that attention is a pivotal part of effective self-regulation (Ayduk, Mischel, & Downey, 2002; Gross, 2001; Nolen-Hoeksema, 1991). Furthermore, tracking language use provides information about where attention is focused (Tausczik & Pennebaker, 2010). Specifically, personal pronouns (e.g., "I" or "we") and verb tense (e.g., past, present, or future) are revealing of attentional focus (Tausczik & Pennebaker,

2010). Personal pronouns shed light on the subject of attention, and verb tense provides information about the temporal focus of attention.

### *Attentional Focus: Subject of Attention*

One example of how personal pronouns point to the subject of attention is that people who are in pain, either physical or emotional, have been shown to use more first-person singular pronouns, like “I,” “me,” and “my,” a reflection that their attention is focused inward (Rude, Gortner, & Pennebaker, 2004). In contrast to the self-focus revealed by first-person singular pronouns, first-person plural pronouns (e.g., “we,” “us,” “our”) can indicate a group identity or sense of feeling socially connected to a group. In addition, whereas first-person singular pronouns can indicate greater emotionality, first-person plural pronouns reflect greater psychological distance or a sense of being detached (Tausczik & Pennebaker, 2010).

Furthermore, several studies have demonstrated that flexibility of pronoun use, most commonly shifting from first-person singular to first-person plural pronouns, when writing about a traumatic event is related to health improvements (Campbell & Pennebaker, 2003; Pennebaker, Mehl, & Niederhoffer, 2003). Pennebaker et al. posited that the healing effects of such pronoun shifts, from “I” to “we,” might indicate that changing perspectives is an adaptive strategy in the context of coping with a traumatic event.

### *Attentional Focus: Temporal Focus of Attention*

The focus of individuals’ temporal attention—past, present, or future—is captured in language by verb tense (Tausczik & Pennebaker, 2010) and is significant for several reasons. For instance, engaging with and confronting the past has been shown to be adaptive in the context of expressive writing paradigms (e.g., Pennebaker, 1997) as well as clinical interventions, such as Prolonged Exposure Therapy and Cognitive Processing Therapy, used to treat people with posttraumatic stress disorder; in both therapies, individuals are guided in a process of reliving the traumatic experience (Resick, Nishith, Weaver, Astin, & Feuer, 2002). Dwelling on the past in a ruminative fashion, however, has been associated with negative psychological outcomes (Nolen-Hoeksema, 2000). Furthermore, previous research has demonstrated benefits associated with writing about the future. Specifically, writing about one’s best possible future self led to increased subjective well-being and decreased illness at a 5-month follow-up compared with a control group (King, 2001) and writing about how one plans to cope with the transition to college was associated with physical health benefits (Cameron & Nicholls, 1998). In addition, in an expressive writing study, increased use of future-tense words over the course of writing was associated with two key aspects of mindfulness: observing and describing present stimuli (Moore & Brody, 2009). This is significant because mindfulness, which entails nonjudgmental awareness of experiences in the present moment (Kabat-Zinn, 1990), has been shown to foster psychological well-being (Teasdale, Segal, & Williams, 2003).

## *Insightful and Causal Thinking*

Previous research on expressive writing has demonstrated the significance of two other cognitive processes—insightful thinking and causal thinking. For example, previous research has demonstrated that participants whose mental health improved most after a writing task used an increasing number of insight words (e.g., “acknowledge” and “notice”), implying increased awareness over the course of the writing experiment (Pennebaker, Colder, & Sharp, 1990; Pennebaker & Francis, 1996). Another study found that increased use of words associated with insightful thinking was linked to improved physical health (Pennebaker, Mayne, & Francis, 1997). King (2001) concluded that mounting evidence suggested that the mechanism for expressive writing could be insight driven. In addition, previous research on expressive writing has demonstrated that increased use of words associated with causal thinking, such as “cause” and “effect,” across a writing task has been associated with improved physical health benefits (Pennebaker et al., 1997; Pennebaker et al., 2003; Pennebaker & Francis, 1996).

## **The Present Study**

The present study uses linguistic analysis to investigate the psychological changes associated with an emotion regulation strategy integrating psychological acceptance and positive reappraisal, as compared to emotional disclosure (i.e., standard expressive writing paradigm) or positive reappraisal alone, drawing on the writings of 269 undergraduate participants who wrote for 4 consecutive days, 20 minutes each day, about the biggest problem in their lives and were randomly assigned to one of these three emotion regulation strategies. In brief, in the emotional disclosure condition, participants were encouraged to write about their deepest thoughts and feelings. In the positive reappraisal condition, participants were asked to write only about the positive aspects of their problem, and in the acceptance + positive reappraisal condition, participants were asked to write freely about their negative emotions for the first 2 days and then about the positive aspects of the problem for the next 2 days. Linguistic analyses were conducted to examine changes in cognitive and emotional processes. Analyses of cognitive processes involved tracking changes in attentional focus (including the subject of attention and temporal focus of attention) and insightful and causal thinking. Analyses of underlying emotional processes focused on negative emotions and positive emotions.

## **Method**

### *Participants*

Three hundred and fifteen undergraduate students at the University of Texas at Austin participated in an expressive-writing study either to receive course credit for an Introduction to Psychology class or to earn a chance at winning a raffle. The present

study uses the 269 participants who completed all 4 days of writing. The sample consisted of 173 women (64.3%) and 96 men (35.7%). The ethnic origin distribution was as follows: 38.3% White or Caucasian; 21.9% Asian; 17.1% Hispanic, Latino, or Spanish origin; 5.9% African American; 2.2% Other; 0.4% American Indian or Alaskan Native; and 0.4% Native Hawaiian or Other Pacific Islander; ethnicity data were not reported for the remaining 13.8%. On average, participants wrote 394 words each day of the experiment.

### *Background on Writing Samples*

Writing samples that were used in the present study for linguistic analysis came from an expressive-writing experiment that pitted a new emotion regulation strategy integrating psychological acceptance and positive reappraisal against two established strategies for increasing well-being—emotional disclosure (i.e., standard expressive writing paradigm; Pennebaker, 1997) and positive reappraisal (Gross & John, 2003)—to test the impact the new paradigm had on emotional well-being (North et al., 2011).

In the experiment, participants first completed preintervention measures of emotional well-being. Next, they were randomly assigned to one of three writing conditions, emotional disclosure, positive reappraisal, or acceptance + positive reappraisal, and using the assigned strategy, all participants wrote about the biggest problem in their lives at the present time. They wrote for 20 minutes each day, for 4 consecutive days. Participants in all conditions were informed at the outset of the experiment that they would be asked to write about their problem for all 4 days of writing. After the writing portion on the fourth day of the experiment, participants completed postintervention measures of emotional well-being.

As a brief overview of the writing instructions associated with each of the three conditions (see North et al., 2011, for complete writing instructions for all conditions), the emotional disclosure condition was based on Pennebaker's (1997) expressive-writing paradigm and encouraged participants to write about their deepest thoughts and feelings and provided little specific instruction. The positive reappraisal condition was based on research supporting the benefits of cognitive reappraisal (Gross & John, 2003) and asked participants to write only about the positive aspects of their problem. Integrating these two approaches, the acceptance + positive reappraisal condition asked participants to write freely about their negative emotions for the first 2 days and then about the positive aspects of the problem for the next 2 days. Results indicated that the integrative strategy led to better emotional well-being at postintervention, controlling for preintervention, including greater happiness and positive emotions, marginally fewer negative emotions, and greater overall psychological acceptance.

### *Procedure*

For the present study, we analyzed the text of the writing samples using LIWC (Pennebaker et al., 2007) to examine the psychological changes resulting from the

acceptance + positive reappraisal paradigm as compared to the other two paradigms, emotional disclosure and positive reappraisal alone. LIWC categorizes words into approximately 80 language categories, including conventional language categories (e.g., articles, prepositions, pronouns) as well as psychological processes, (e.g., cognitive processes, positive- and negative-emotion words) and relativity-related words (e.g., verb tense, time, space; Pennebaker et al., 2003). LIWC reports results for each category as a percentage of total words. It has been validated in many studies and has provided significant evidence about the psychological correlates of word use (see Pennebaker et al., 2003; Tausczik & Pennebaker, 2010).

### Measures

LIWC word variables were used as measures of cognitive and emotional processes. Analyses of cognitive processes involved tracking changes in attentional focus, including the subject of attention and temporal focus of attention, and insightful and causal thinking. Analyses of underlying emotional processes focused on negative emotions and positive emotions.

*Emotional processes.* The words that capture emotional processes are negative-emotion words (e.g., sad, hurt, dread, jerk) and positive-emotion words (e.g., hope, value, love, considerate).

*Cognitive processes.* The words that reflect attentional processes relating to the subject of attention are first-person singular pronouns (e.g., I, me, my) and first-person plural pronouns (e.g., we, us, our). The words that reflect attentional processes relating to the temporal focus of attention are verb tense categories—past, present, and future. The words that reflect insightful thinking in LIWC are called insight words (e.g., accept, acknowledge, notice, seem) and those that reflect causal thinking are called causal words (e.g., attribute, cause, effect, solve).

### Analyses

We used 3 (writing condition)  $\times$  2 (time) mixed-model analyses of variance (ANOVA) to examine differences between groups in language use from the first half to the second half of the experiment. Following previous studies that have analyzed change in language use in expressive writings (e.g., Pennebaker et al., 1997), we examined change across two points. Whereas some previous studies based analyses on the first and last days of writings, we decided to enhance the stability of estimates by examining the first half and second half of writings. Time 1 was calculated as an average across the first half of writing (Days 1 and 2) and Time 2 was an average across the second half of writing (Days 3 and 4). Language variables of interest related to emotional processes (negative-emotion words, positive-emotion words) and cognitive processes, including attentional processes (first-person singular pronouns and first-person plural pronouns) and cognitive mechanisms (insight words, causal words). In addition, because we were specifically interested in investigating the psychological changes associated with the

acceptance + positive reappraisal condition, we conducted two a priori contrasts to investigate specific differences between this condition and each of the other two conditions.

## Results

Analyses were conducted on change in language use relating to emotional and cognitive processes. However, since writing instructions in the acceptance + positive reappraisal condition and positive reappraisal condition were emotion specific (i.e., they instructed participants about which emotions to express), the analyses of emotional processes serve primarily as an integrity check. Means and standard deviations for all word category variables in the first and second halves of the experiment, by condition, are presented in Table 1. Results of the ANOVAs for cognitive processes are presented in Table 1.<sup>1</sup>

### *Analyses of Emotional Processes*

*Negative Emotions.* There was a condition  $\times$  time interaction for negative emotion words,  $F(2, 266) = 59.19, p < .01$ . A priori planned contrasts indicated that there were significant differences between the acceptance + positive reappraisal condition and each of the other two conditions: emotional disclosure,  $F(1, 184) = 67.32, p < .01$ , and positive reappraisal,  $F(1, 180) = 89.34, p < .01$ . Specifically, negative-emotion words decreased more from Time 1 to Time 2 for the acceptance + positive reappraisal condition than for the other two conditions.

*Positive Emotions.* A condition  $\times$  time interaction was found for positive emotion words,  $F(2, 266) = 60.26, p < .01$ . A priori planned contrasts indicated that there were significant differences between the acceptance + positive reappraisal condition and each of the other two conditions: emotional disclosure,  $F(1, 184) = 75.09, p < .01$ , and positive reappraisal,  $F(1, 180) = 94.41, p < .01$ . Specifically, positive emotion words increased more from Time 1 to Time 2 for the acceptance + positive reappraisal condition than for the other two conditions.

### *Analyses of Cognitive Processes*

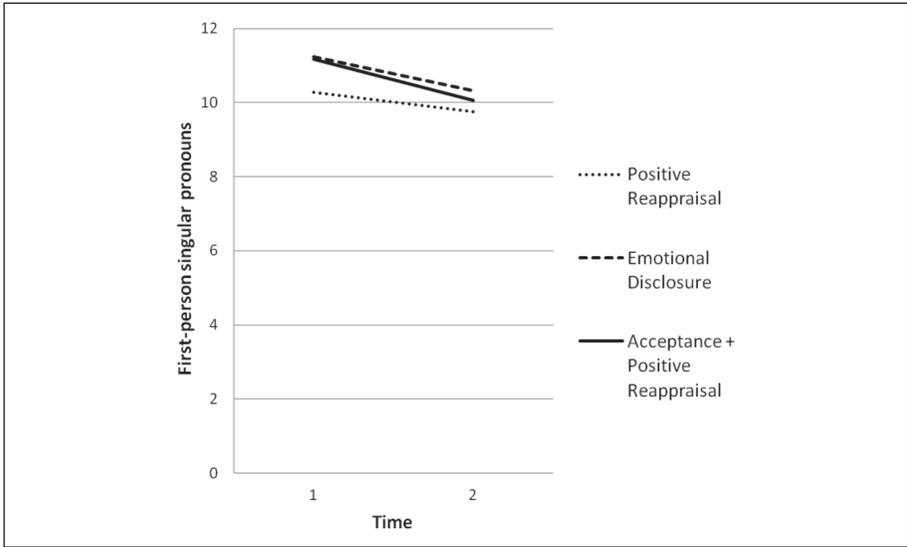
#### *Attentional Focus: Subject of Attention*

*First-person singular pronouns.* There was a main effect for time for first-person singular pronouns,  $F(1, 266) = 44.34, p < .01$ . Figure 1 demonstrates how use of first-person singular pronouns decreased for all writing conditions from Time 1 to Time 2. There was no significant condition  $\times$  time interaction,  $F(2, 266) = 2.06, p = .130$ , though a priori planned contrasts indicated that there were significant differences between the acceptance + positive reappraisal condition and the positive reappraisal condition,  $F(1, 180) = 4.69, p < .05$ . Figure 1 depicts how first-person singular pronoun use

**Table 1.** Change in Language Use (as a Percentage of Overall Word Use) for Three Writing Conditions Across Time 1 and Time 2.

Variable	Writing condition	Time 1		Time 2		F(df)
		mean (SD)	mean (SD)	mean (SD)	mean (SD)	
Negative-emotion words	Emotional disclosure	2.74 (1.04)	2.73 (.85)	Condition	F(2, 266) = 14.26**	
	Positive reappraisal	2.13 (1.16)	2.29 (1.21)	Time	F(1, 266) = 42.69**	
	Acceptance + positive reappraisal	3.84 (1.46)	2.12 (1.21)	Condition x time	F(2, 266) = 59.19**	
Positive-emotion words	Emotional disclosure	3.35 (1.08)	3.59 (1.33)	Condition	F(2, 266) = 38.57**	
	Positive reappraisal	5.01 (1.39)	4.96 (1.63)	Time	F(1, 266) = 72.88**	
	Acceptance + Positive reappraisal	3.05 (1.04)	5.22 (1.58)	Condition x time	F(2, 266) = 60.26**	
First-person singular pronouns	Emotional disclosure	11.25 (2.13)	10.32 (2.39)	Condition	F(2, 266) = 3.36*	
	Positive reappraisal	10.27 (2.21)	9.77 (2.20)	Time	F(1, 266) = 44.34**	
	Acceptance + Positive reappraisal	11.18 (2.32)	10.06 (2.36)	Condition x time	F(2, 266) = 2.06	
First-person plural pronouns	Emotional disclosure	.42 (.58)	.41 (.50)	Condition	F(2, 266) = 2.05	
	Positive reappraisal	.31 (.53)	.35 (.83)	Time	F(1, 266) = 6.23*	
	Acceptance + positive reappraisal	.36 (.47)	.68 (1.20)	Condition x time	F(2, 266) = 4.93**	
Past-tense words	Emotional disclosure	3.12 (1.78)	2.92 (1.59)	Condition	F(2, 266) = 18.54**	
	Positive reappraisal	1.86 (1.42)	1.76 (1.12)	Time	F(1, 266) = 18.07**	
	Acceptance + positive reappraisal	3.10 (1.80)	2.21 (1.34)	Condition x time	F(2, 266) = 7.14**	
Present-tense words	Emotional disclosure	10.08 (2.25)	9.97 (2.28)	Condition	F(2, 266) = 2.74; p = .07	
	Positive reappraisal	9.54 (2.09)	9.67 (2.34)	Time	F(1, 266) = 0.46	
	Acceptance + positive reappraisal	10.16 (2.42)	10.41 (2.03)	Condition x time	F(2, 266) = 0.66	
Future-tense words	Emotional disclosure	.92 (.56)	.95 (.54)	Condition	F(2, 266) = 26.98**	
	Positive reappraisal	1.76 (1.25)	1.82 (1.39)	Time	F(1, 266) = 14.63**	
	Acceptance + positive reappraisal	.84 (.57)	1.46 (1.00)	Condition x time	F(2, 266) = 10.40**	
Causal words	Emotional disclosure	1.97 (.76)	1.88 (.65)	Condition	F(2, 266) = 9.32**	
	Positive reappraisal	2.19 (.85)	2.43 (.82)	Time	F(1, 266) = 0.374	
	Acceptance + positive reappraisal	2.08 (.68)	2.03 (.66)	Condition x time	F(2, 266) = 3.73**	
Insight words	Emotional disclosure	3.19 (1.04)	2.81 (1.10)	Condition	F(2, 266) = 5.20**	
	Positive reappraisal	3.45 (1.14)	3.30 (1.08)	Time	F(1, 266) = 3.86; p = .05	
	Acceptance + positive reappraisal	3.32 (.97)	3.44 (1.06)	Condition x time	F(2, 266) = 4.59*	

\*p < .05. \*\*p < .01.



**Figure 1.** Change in first-person singular pronouns from Time 1 (averaged across Days and 1) to Time 2 (averaged across Days 3 and 4) among writing conditions.

decreased more for the acceptance + positive reappraisal condition than the positive reappraisal condition from Time 1 to Time 2.

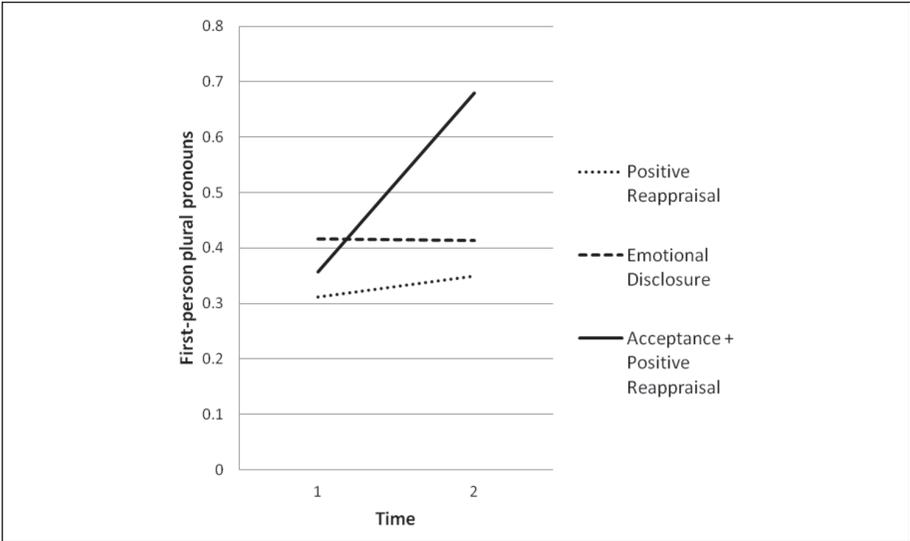
*First-person plural pronouns.* There was a significant condition × time interaction for first-person plural pronouns,  $F(2, 266) = 4.93, p < .01$ , and a priori planned contrasts revealed that there were significant differences between the acceptance + positive reappraisal condition and both of the other two conditions: emotional disclosure,  $F(1, 184) = 7.22, p < .01$ , and positive reappraisal,  $F(1, 180) = 5.38, p < .05$ . Figure 2 indicates that first-person plural pronoun use increased more from Time 1 to Time 2 for participants in the acceptance + positive reappraisal condition than participants in the other two conditions.

**Attentional Focus: Temporal Focus of Attention**

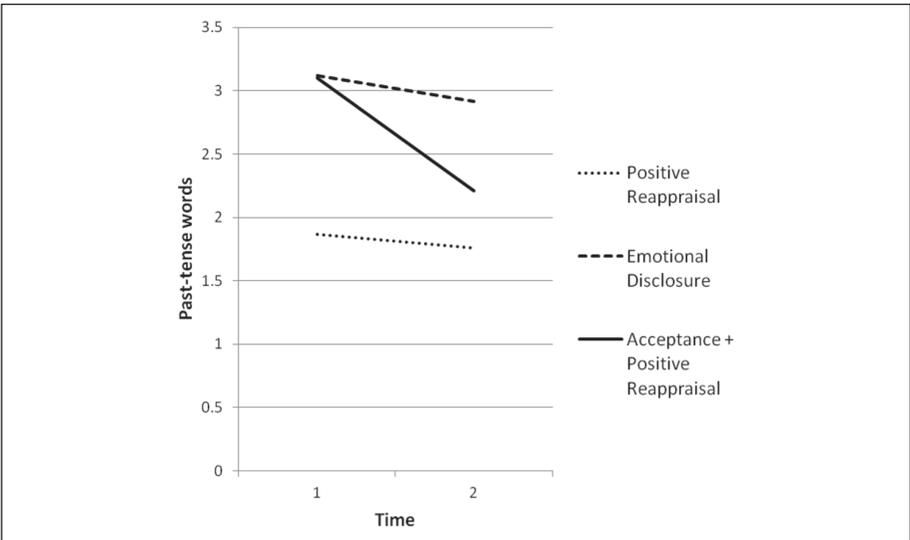
*Past-tense words.* There was a significant condition × time interaction for past-tense words,  $F(2, 266) = 7.14, p < .01$ , and a priori planned contrasts revealed that there were significant differences between the acceptance + positive reappraisal condition and each of the other two conditions: emotional disclosure,  $F(1, 184) = 7.33, p < .01$ , and positive reappraisal,  $F(1, 180) = 15.16, p < .01$ . Figure 3 demonstrates how past-tense word use decreased more from Time 1 to Time 2 for the acceptance + positive reappraisal condition than for the other two conditions.

*Present-tense words.* A condition × time interaction was not found for present-tense words,  $F(2, 266) = 0.66, p > .05$ .

*Future-tense words.* A condition × time interaction was found for future-tense words,  $F(2, 266) = 10.40, p < .01$ , and a priori planned contrasts revealed that there were

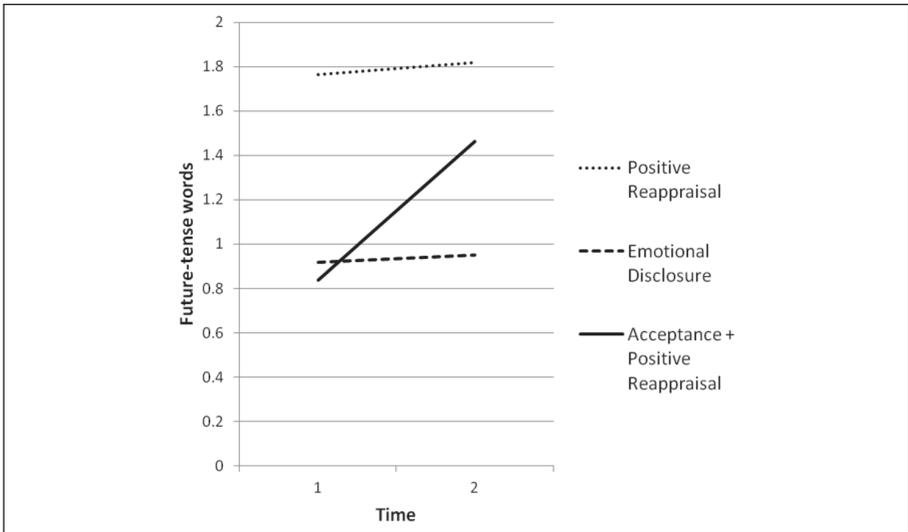


**Figure 2.** Change in first-person plural pronouns from Time 1 (averaged across Days 1 and 2) to Time 2 (averaged across Days 3 and 4) among writing conditions.



**Figure 3.** Change in past-tense words from Time 1 (averaged across Days 1 and 2) to Time 2 (averaged across Days 3 and 4) among writing conditions.

significant differences between the acceptance + positive reappraisal condition and each of the other two conditions: emotional disclosure,  $F(1, 184) = 17.50, p < .01$ , and positive reappraisal,  $F(1, 180) = 12.14, p < .01$ . Figure 4 shows that future-tense words



**Figure 4.** Change in future-tense words from Time 1 (averaged across Days and 1) to Time 2 (averaged across Days 3 and 4) among writing conditions.

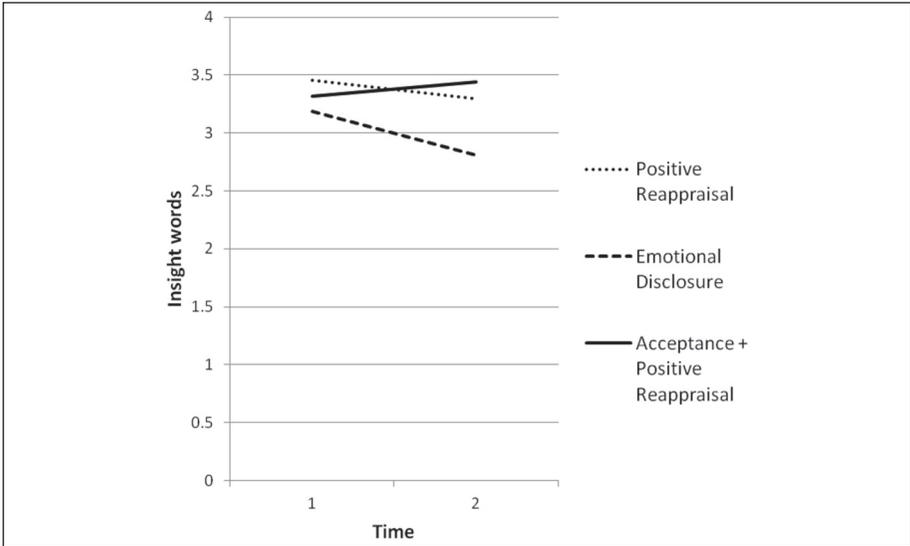
increased more from Time 1 to Time 2 for the acceptance + positive reappraisal condition than the other two conditions.

### Causal Thinking

**Causal words.** There was a significant condition  $\times$  time interaction for causal words,  $F(2, 266) = 3.73, p < .05$ , and a priori planned contrasts revealed that there were significant differences between the acceptance + positive reappraisal condition and the positive reappraisal condition,  $F(1, 180) = 4.70, p < .05$ , but not the emotional disclosure condition,  $F(1, 184) = 0.09, p > .05$ . Specifically, causal words did not increase for those in the acceptance + positive reappraisal condition or emotional disclosure condition but did increase for those in the positive reappraisal condition.

### Insightful Thinking

**Insight words.** There was a significant condition  $\times$  time interaction for insight words,  $F(2, 266) = 4.59, p < .05$ . A priori planned contrasts revealed that there was a significant difference between the acceptance + positive reappraisal condition and the emotional disclosure condition,  $F(1, 184) = 9.66, p < .01$ , and a marginally significant difference between the acceptance + positive reappraisal condition and the positive reappraisal condition,  $F(1, 180) = 2.68, p = .10$ . Figure 5 depicts how insight words increased more from Time 1 to Time 2 for the acceptance + positive reappraisal condition than for the other two conditions.



**Figure 5.** Change in insight words from Time 1 (averaged across Days 1 and 2) to Time 2 (averaged across Days 3 and 4) among writing conditions.

## Discussion

The present study used linguistic analysis to investigate the psychological changes associated with an emotion regulation strategy integrating psychological acceptance and positive reappraisal, as compared to emotional disclosure or positive reappraisal alone. The study was based on the writings of 269 undergraduate participants who wrote for 4 consecutive days, 20 minutes each day, about the biggest problem in their lives. Analyses of cognitive processes involved tracking changes in attentional focus (including the subject of attention and temporal focus of attention) and insightful and causal thinking. Analyses of underlying emotional processes focused on negative emotions and positive emotions. In short, we used linguistic analysis of expressive writing samples as an “x-ray” to elucidate changes in cognitive and emotional processes.

Examining changes in attentional focus is important because previous research has demonstrated that attention is a pivotal part of effective self-regulation (Ayduk et al., 2002; Gross, 2001; Nolen-Hoeksema, 1991). The present findings revealed two key changes in cognitive processes relating to attentional focus associated with using an emotion regulation strategy integrating psychological acceptance and positive reappraisal. The first change relates to the subject of attention (i.e., on whom the participant’s attention is focused), and the second change relates to the temporal focus of attention—whether the participant’s attention is focused on the past, present, or future.

From a language perspective, the subject of attention is reflected in personal pronouns. Findings relating to the subject of attention demonstrated that participants who integrated acceptance and positive reappraisal, like those who used a strategy

of emotional disclosure or positive reappraisal alone, used less first-person singular pronouns (like “I” and “my”) over time, and people using the integrative strategy decreased their use of these words more than people who used positive reappraisal alone. This indicates that participants start with more of a self-focus, in which attention is focused inward and then, over the course of writing, shift the focus away from the self. Although this pattern occurs for all participants, irrespective of the emotion regulation strategy they employ, it occurs more for people integrating psychological acceptance and positive reappraisal than those using a strategy of positive reappraisal alone.

In contrast, people using the integrative strategy increase more in their use of first-person plural pronouns (like “we” and “our”) than people using either of the other two strategies: emotional disclosure or positive reappraisal alone. Whereas first-person singular pronouns indicate a self-focus, first-person plural pronouns can indicate a group focus and a feeling of being socially connected to a group (Tausczik & Pennebaker, 2010) and reflect a sense of shared identity and interdependence, as well as motivation to affiliate (Slatcher, Vazire, & Pennebaker, 2008). Furthermore, whereas first-person singular pronouns are associated with greater emotionality, first-person plural pronouns are associated with greater psychological distance or a sense of being detached (Tausczik & Pennebaker, 2010). Participants using the integrative strategy appear to be focusing on themselves and engaging with the emotional pain at the beginning of the writing experiment and then shifting the focus away from themselves and more to a group identity and sense of interdependence, becoming more distanced from the problem over the course of writing. Furthermore, these findings relating to changes in the subject of attention are meaningful because previous research has demonstrated that shifting from using more first-person singular pronouns, like “I,” to more first-person plural pronouns, like “we,” in the context of writing about negative life experiences is associated with health benefits (Pennebaker et al., 2003).

More broadly, previous researchers have argued that the healing effects of such pronoun shifts, from “I” to “we,” might indicate that changing perspectives is an adaptive strategy in the context of coping with a traumatic event (Pennebaker et al., 2003). Similarly, being willing to consider situations from multiple perspectives is consistent with many empirically based therapies, including mindfulness meditation (Brown & Ryan, 2003; Kabat-Zinn, Lipworth, & Burney, 1985), mindfulness-based cognitive therapy (Teasdale et al., 2000), and cognitive therapy (Beck, 1995). The related quality of nonattachment (i.e., not attaching oneself to any singular perspective) has also been associated with improved emotional well-being (Kross, Ayduk, & Mischel, 2005; Segal, Williams, & Teasdale, 2001).

The other key change in cognitive processes relating to attentional focus has to do with the temporal focus of attention—whether the participant’s attention is focused on the past, present, or future. The focus of individuals’ temporal attention is reflected in verb tense (Tausczik & Pennebaker, 2010). Participants who employed a strategy of acceptance and positive reappraisal wrote less about the past over the course of the writing experiment (i.e., past-tense words decreased) than participants who used a strategy of emotional disclosure or positive reappraisal alone. In addition, individuals

who used a strategy of acceptance and positive reappraisal wrote more about the future over the course of the writing experiment (i.e., future-tense words increased) than people in the other two groups.

Taken together, the findings on verb tense imply that people using a strategy of psychological acceptance followed by positive reappraisal start by engaging with the past but over the course of writing transition from concentrating on the past to thinking about the future. This pattern is significant because engaging with and confronting the past has been shown to be adaptive in the context of expressive-writing paradigms (e.g., Pennebaker, 1997), as well as clinical interventions, such as Prolonged Exposure Therapy and Cognitive Processing Therapy used to treat people with posttraumatic stress disorder; in both therapies, individuals are guided in a process of reliving the traumatic experience (Resick et al., 2002). Dwelling on the past in a ruminative fashion, however, has been associated with negative psychological outcomes (Nolen-Hoeksema, 2000), and writing about the future has been shown to provide health benefits (Cameron & Nicholls, 1998; King, 2001).

Considering the findings on changes in cognitive processes relating to both types of attentional focus—subject of attention and temporal focus of attention—is revealing. It appears that combining acceptance of one's negative emotions with efforts to identify positive aspects of the problem may allow people to first look inward and engage with the past, ventilating negative emotions. Then, it nudges them to shift their focus away from themselves and from the past and toward a group focus, a sense of interdependence, a more psychologically distanced stance, and the future. In turn, this entails movement away from rumination in which people think repetitively about negative emotions and focus on them in a way that inhibits action to make positive change (Nolen-Hoeksema, 1991, 2000). This strategy of integrating acceptance and positive reappraisal is consistent with conclusions from a recent expressive-writing study (Seih, Lin, Huang, Peng, & Huang, 2008) that emotional writing ought to have a specific mechanism to foster emotional support while simultaneously preventing an individual from getting stuck in his or her emotional experiences.

In examining changes in other cognitive processes, findings revealed that participants who integrated both psychological acceptance and positive reappraisal increased more in their use of insight words over the course of writing. (This difference was marginally significant with the positive reappraisal group.) This is significant because previous research has indicated that an increasing use of insight words over the course of writing is associated with improvements in health (Pennebaker & Francis, 1996). Previous researchers (Pennebaker et al., 1990) have indicated that using an increasing number of insight words may be associated with greater improved mental health because it implies increased awareness over the course of the writing experiment. In support of this interpretation, the majority of participants in one expressive-writing study reported in the follow-up survey that they benefited from the experimental writing condition because it enhanced awareness of their emotions (Pennebaker et al., 1990).

More generally, awareness, which denotes a recognition of one's own experiences without attachment or investment in those experiences (Hayes & Plumb, 2007), has been shown to be beneficial to psychological well-being. Detached awareness diminishes the detrimental aspects of negative emotions (Hayes & Plumb, 2007), and increasing the awareness of negative thoughts has been shown in other studies to reduce discomfort and negative emotions (Healy et al., 2008; Masuda, Hayes, Sackett, & Twohig, 2004). Causal words, however, did not increase for those who used a strategy integrating acceptance and positive reappraisal or emotional disclosure but did increase for those who used positive reappraisal. Taken together, these findings on insight words and causal words indicate that using a strategy combining acceptance and positive reappraisal leads to increased insight and awareness but not more causal attributions relating to the problem.

Consistent with writing instructions, participants who incorporated acceptance and positive reappraisal decreased their use of negative-emotion words more and increased their use of positive-emotion words more over the course of writing than participants in the other two groups. The greater use of positive emotion words in the latter phase of writing for individuals who integrated psychological acceptance and positive reappraisal combined with the shift from "I" to "we" over the course of writing supports Fredrickson's broaden-and-build theory (Fredrickson, 1998, 2001) that positive emotions broaden perspectives, enhance social integration, and build personal resources (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). In addition, the finding that the shift from "I" to "we" occurred in a much more significant way for participants who used acceptance and then positive reappraisal than for participants who used positive reappraisal alone may imply that in the context of coping with negative life events, the impact of positive emotions is enhanced when preceded by the expression of negative emotions.

A limitation of this study is that although language is a marker of cognitive and emotional processes, language analysis, like other methods such as self-report questionnaires, provides only a partial view into the relevant phenomenon. In addition, the present study is based on a sample of undergraduate university students, which reduces generalizability. Future studies counterbalancing the acceptance and positive reappraisal instructions would contribute to this area of research.

In this study, we used analysis of language as a window into changes in cognitive and emotional processes resulting from an emotion regulation strategy integrating acceptance and positive reappraisal. Taken together, findings reveal that in the context of dealing with the biggest problem in one's life, using an emotion regulation strategy integrating acceptance and positive reappraisal leads people to begin processing in a way that is self-focused and centered on the past, wringing out negative emotions. Then, over time, it leads them to look to the past less and to the future more. It also nudges them to look inward less and to look outward more, assuming a less emotional and more psychologically distant relationship to the problem, focusing more on social connections, signaling a desire to affiliate, and by extension, marshaling social resources. Overall, findings indicate that using a strategy that combines acceptance of one's negative emotions followed by making direct efforts to seek out positive aspects of the problem fosters multiple positive psychological changes.

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## Note

1. Because language variables are not normally distributed, violations of assumptions associated with conducting ANOVAs existed in some cases, so we conducted confirmatory analyses for all analyses presented here. We calculated difference variables (i.e., Time 2 word variable – Time 1 word variable) and conducted nonparametric tests of these variables with writing condition as the group variable. Findings confirmed the results presented here with one slight exception: Whereas the contrast between the acceptance + positive reappraisal writing condition and emotional disclosure condition was significant at the  $p < .01$  level in analyses presented in this article, the significance level in the confirmatory analysis was  $p = .05$ .

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