

Benefits of Expressive Writing in Lowering Rumination and Depressive Symptoms

Eva-Maria Gortner, Stephanie S. Rude, James W. Pennebaker

University of Texas at Austin

Depression-vulnerable college students (with both elevated prior depressive symptoms and low current depressive symptoms) wrote on 3 consecutive days in either an expressive writing or a control condition. As predicted, participants scoring above the median on the suppression scale of the Emotion Regulation Questionnaire (Gross & John, 2003) showed significantly lower depression symptoms at the 6-month assessment when they wrote in the expressive writing versus the control condition. Additional analyses revealed that treatment benefits were mediated by changes in the Brooding but not the Reflection scale of the Ruminative Response Scale (Nolen-Hoeksema & Morrow, 1991). A “booster” writing session predicted to enhance treatment benefits failed to have a significant effect.

ACCORDING TO RECENT ESTIMATES, close to 20% of individuals will experience an episode of depression at some point in their lives (Gotlib & Hammen, 2002). Among individuals who have recovered from depression, approximately 75% to 80% will have another depressive episode (Judd, 1997; Keller & Boland, 1998). In fact, the risk of subsequent depression is best predicted by past depression and increases with the number of previous episodes (Hammen, 1990). The aim of the current

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Address correspondence to Eva-Maria Gortner, University of Houston, Counselling and Psychological Services, 226 Student Svc Ctr I, Houston, TX 77204-3026, USA; e-mail: evagortner@sbcglobal.net.

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study was to explore the benefits of an expressive writing intervention in reducing subsequent depression symptoms among formerly depressed (and hence depression vulnerable) individuals.

Cognitive theories (e.g., Beck, 1967, 1976) account for the phenomenon of recurrent depression by proposing that depressive schemas are dormant when an individual is remitted from a depressive episode but emerge in the face of stress or negative life events, bringing about depressive episodes in predisposed individuals. In support of this idea, it has been shown that formerly depressed individuals possess negative processing biases (e.g., Gilboa & Gotlib, 1997; Hedlund & Rude, 1995; Ingram, Miranda, & Segal, 1998; Miranda & Persons, 1988; Rude, Covich, Jarrold, Hedlund, & Zentner, 2001; Wenzlaff, Rude, Taylor, Stultz, & Sweatt, 2001) and that such biases are predictive of subsequent depression (e.g., Metalsky, Abramson, Seligman, Semmel, & Peterson, 1982; Rude, Valdez, Odom, & Ebrahimi, 2003; Rude, Wenzlaff, Gibbs, Vane, & Whitney, 2002; Segal, Gemar, & Williams, 1999).

It is likely that maladaptive emotion-regulation strategies also contribute to the vulnerability of formerly depressed individuals. Research on mood-control strategies suggests that formerly depressed individuals are prone to both thought suppression and rumination. Wenzlaff and colleagues (e.g., Rude et al., 2002; Wenzlaff, 1993) have found higher rates of self-reported thought suppression in formerly depressed individuals. Presumably, these individuals actively try to suppress and inhibit dysfunctional negative thoughts in order to control their mood and prevent relapse into depression. Studies using cognitive load indicate that when formerly depressed individuals are taxed by time pressures and competing cognitive demands, they show negative processing biases that are not

otherwise apparent (Wenzlaff, 1993; Wenzlaff & Bates, 1998; Wenzlaff & Eisenberg, 2001; Wenzlaff et al., 2001).

Paradoxically, tendencies to ruminate as well as tendencies to suppress and avoid negative thoughts are observed among individuals recovered from depression. Rumination may be linked to thought suppression in part because suppression requires considerable cognitive resources and is prone to fail in the presence of competing cognitive strains. When this occurs, suppressed thoughts may become chronically accessible (Wegner, 1994; Wegner & Wenzlaff, 1996; Wenzlaff, 1993).

Rumination, defined as, "... cognitions and behaviors that repetitively focus the depressed individual's attention on his or her symptoms and the possible causes and consequences of those symptoms" (Nolen-Hoeksema, 1998, p. 404), has been linked to vulnerability to depressed mood and onsets of depressive episodes. For example, a prospective study of college students by Just and Alloy (1997) found that ruminative response styles increased the chances of a nondepressed individual experiencing a depressive episode over 18 months after recruitment and that rumination increased the severity of the episode. In addition, a longitudinal study of bereavement found that individuals with a more ruminative style of responding during the time of their loss had higher levels of depressive symptoms during the 18 months following the loss (Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema, Larson, & Grayson, 1999).

Because persistent rumination and attempts to suppress negative thoughts may indicate incomplete or unsuccessful cognitive processing (Lepore & Greenberg, 2002; Lumley, Tojek, & Macklem, 2002), an intervention that promotes cognitive processing of adverse events would be likely to reduce accessibility to depressive cognitive structures and thereby help prevent future depressive episodes. One such intervention is expressive writing. Benefits of the expressive writing paradigm have been replicated across diverse populations in multiple countries (for reviews, see Lepore & Smyth, 2002; Pennebaker, 1997). The procedure of expressive writing usually unfolds as follows: Participants randomly assigned to the experimental condition are asked to write about emotionally upsetting experiences for 15 to 20 minutes a day for 3 to 4 consecutive days, whereas control group participants are asked to write about superficial topics, such as time management.

Numerous studies have found that writing about one's deepest thoughts and feelings about emotional upheavals can positively affect mental and physical health (Sloan & Marx, 2004; Smyth,

1998). Compared to controls, participants who engaged in expressive writing have made fewer physician visits for illnesses in the months following the intervention (e.g., Pennebaker & Beall, 1986; Stanton et al., 2000), shown improved immune and hormonal functioning (e.g., Booth, Petrie, & Pennebaker, 1997; Pennebaker, Kiecolt-Glaser, & Glaser, 1988), and improved functioning in other biological markers of stress or disease (e.g., Petrie, Booth, Pennebaker, Davison, & Thomas, 1995). Behavioral enhancements attributable to expressive writing include improved grade point average in college students (e.g., Lumley & Provenzano, 2003), reduced absenteeism from work (Francis & Pennebaker, 1992), and faster job re-acquisition in laid-off workers (Spera, Buhrfeind, & Pennebaker, 1994).

Despite compelling evidence for the benefits of expressive writing on a wide range of outcome variables, few studies have assessed the impact of expressive writing on depression symptoms. What little evidence there is, is promising, however. Lepore (1997) observed a significant decline in depressive symptoms as measured by the SCL-90-R among college students assigned to expressive writing over the month preceding an exam. More recently, Sloan and Marx (2004) found fewer depressive symptoms at a 4-week follow-up in women with PTSD symptoms assigned to expressive writing compared to control participants. In addition, Graf (2004) found that psychotherapy outpatients who completed two written disclosure homework exercises displayed significantly greater declines in symptoms of depression and anxiety, as measured by the Depression Anxiety Stress Scales (Lovibond & Lovibond, 1995), than did the control group. However, none of these studies focused on the specific population of formerly depressed, depression-vulnerable individuals. Furthermore, these studies allowed only relatively brief follow-up periods to assess postintervention benefits (approximately 1 month).

Therefore, the primary purpose of the current study was to examine possible benefits of the expressive writing paradigm in reducing the recurrence of depression symptoms over a 6-month period in a sample of students with a history of depression. In order to maximize the chances of observing elevated depression scores in controls and, hence, treatment differences, assessments were made 5 weeks and again 6 months following the writing intervention. Since expressive writing is thought to benefit individuals by lifting inhibitions against expression and by allowing previously avoided material to be processed and organized, we expected it to produce the largest gains for the

subgroup that relied most heavily on suppression to regulate their emotions. This prediction is in line with previous evidence as summarized by Lumley et al. (2002): "... people who recognize having negative emotions but who are ambivalent over expressing them, who attempt to inhibit or avoid them, or who have intrusive thoughts and worry, are most likely to benefit from disclosure" (p. 89). Hence, we predicted that participants with higher scores on the Suppression Scale of the Emotion Regulation Questionnaire (Gross & John, 2003) would benefit most from expressive writing.

In addition, hypotheses about expressive writing's mechanism of action—specifically, the role of reductions in rumination in mediating benefits of writing—were explored. On the face of it, the expectation that expressive writing will reduce rumination seems paradoxical, since rumination has been characterized as paying too much attention to distress. Whereas Nolen-Hoeksema and colleagues (e.g., Nolen-Hoeksema, Parker, & Larson, 1994) have suggested distraction from distressing thoughts as an alternative to rumination, the expressive writing intervention asks individuals to focus on distressing thoughts and emotions. However, a number of researchers (e.g., Rude, Maestas, & Neff, *in press*; Segerstrom, Stanton, Alden, & Shortridge, 2003; Trapnell & Campbell, 1999; Treynor, Gonzalez, & Nolen-Hoeksema, 2003; Watkins, 2004) have observed that both productive and unproductive ways of attending to one's distress exist. Hence, it appears that rumination may consist of paying the wrong kind of attention to problems. While consensus does not yet exist as to what the "right kind" of attention is, it appears that attention directed toward problem-solving or attention devoid of negative judgments may be more productive than rumination.

The Ruminative Responses Scale (RRS; Nolen-Hoeksema & Morrow, 1991), used in most of the research on ruminative thinking and depression, has been shown to be multifactorial (Roberts, Gilboa, & Gotlib, 1998; Rude et al., *in press*; Treynor et al., 2003). After excluding items that were explicitly confounded with depression symptoms, Treynor et al. identified two factors in the remaining items: the Brooding factor was strongly associated with depression and the Reflective Pondering or Reflection factor was fairly weakly correlated with concurrently measured depression and did not predict subsequent increases in depression.

Rude et al. (*in press*) noted that brooding differs from reflection primarily in the self-judgment contained in the items of the RRS. For example, brooding items include, "Think, 'Why do I always

react this way?'" and "Think, 'Why do I have problems other people don't have?'" Reflection items, on the other hand ("Go away by yourself and think about why you feel this way"), convey attention to distress without an added layer of judgment. Rude et al. argued that it is likely not the focusing of attention on problems and their attendant distress that drives harmful effects of rumination, but rather the negative judgment of the experience.

We speculated that the mechanism through which expressive writing might benefit depression-prone individuals would be reductions in the unproductive self-judgment of experience that characterizes the brooding dimension of rumination. Since instructions given in the expressive writing paradigm encourage participants to "let go" and explore their "deepest thoughts and feelings" about troubling events, it seems likely that expressive writing would counter the inhibiting self-judgments that seem to characterize the brooding state. Hence, we predicted that improvements in depression symptoms would be mediated by improvements in brooding scores—that confronting one's distressing thoughts and feelings would tend to reduce self-judgments about difficult emotional experiences (brooding), and that this would in turn reduce participants' susceptibility to depression symptoms over the follow-up period. On the other hand, we did not expect simple attention to distress (reflective pondering) to be altered by or to mediate benefits of expressive writing.

Finally, the utility of a "booster" writing session in enhancing benefits of expressive writing was explored. Booster sessions are hypothesized to consolidate prior therapeutic gains in cognitive therapy of depression and depression-related phenomena (Beck, Rush, Shaw, & Emery, 1979). Several studies have found significant effects of booster sessions in the maintenance of psychotherapeutic gains from cognitive-behavioral interventions (e.g., Clarke, Rohde, Lewinsohn, Hops, & Seeley, 1999; Riedel, Fenwick, & Jillings, 1986). Hence, this study aimed to explore the therapeutic effectiveness of a booster expressive writing session.

Method

OVERVIEW OF STUDY

Undergraduate students who reported elevated symptoms of depression in the past but whose present level of depressive symptoms was within normal levels were recruited and randomly assigned to write for 20 min on 3 consecutive days in either emotionally expressive (writing about their deepest

thoughts and feelings on current and past emotional upheavals) or control (writing objectively about their time management) conditions. Half of the treatment and control participants were randomly assigned to complete a 20-min booster session 5 weeks after the initial intervention. (The 5-week assessment point was driven by the constraint of keeping this assessment within the same semester as the pretest and intervention phases). For data analyses, participants were divided into high and low emotion suppression groups based on their pretest scores on the Suppression Scale of Gross's Emotion Regulation Questionnaire (Gross & John, 2003). Rumination and depression symptoms were assessed immediately prior to writing, 5 weeks later (immediately before the booster session for participants assigned to that condition), and 6 months after writing.

PARTICIPANTS

The current sample of 90 students (66 women and 24 men) was culled from an initial pool of approximately 1,900 students who completed on-line prescreening measures for the Psychology Department research pool at the University of Texas. Participants were initially deemed eligible if they scored below 13 on the Beck Depression Inventory (BDI; Beck et al., 1979) and above 25 on the Inventory to Diagnose Depression–Lifetime (IDD-L; described below) at pretest, approximately 1 month prior to the start of the study. Further, participants were only eligible if the symptoms reported on the IDD-L had been remitted for at least 2 months. Established norms for the IDD-L have not been reported, but the IDD-L cutoff of 25 was used by Rude, Gortner, & Pennebaker (2004) to define a formerly depressed group, and this score was the 75th percentile in that large sample of college students. The BDI cutoff score was chosen because a score of 13 or 14 is often used as the threshold for mild depression (cf. Beck, 1967) and we wanted to recruit a sample that was not currently depressed.

Two hundred and three participants met the above criteria and were sent emails inviting them to participate in the study as a means to fulfill a requirement for research participation. The email indicated that the research focus was on the effects of writing and required participants to come into the lab on two occasions during the current semester, as well as a third time the following semester, and included on-line portions as well. The email further indicated that participation in the study would satisfy all 5 of the research hours they were required to complete as introductory psychology students. Of the 203 individuals invited, 108 (53.2%) agreed to participate and were scheduled

for the first session. The remaining 95 either did not respond or, in a handful of cases, responded to say that they had already completed their research requirement. Students in the psychology research pool have a variety of studies to choose from to satisfy the research requirement; many of those who failed to volunteer had most likely already completed some or all of their research hours.

Immediately preceding the first writing session, participants were readministered the BDI. Eleven participants were released from the study due to a BDI score of 13 or greater. Hence, 97 (70 women and 27 men) began the study. All 97 completed the writing intervention and the 5-week assessment.

At the beginning of the study, participants were randomly assigned to treatment condition with the constraint that more were assigned to the experimental condition ($n = 57$) than the control condition ($n = 40$). (The need to compute stable estimates of the means for the expressive booster and no-booster conditions led us to allocate more of the limited number of participants to the experimental, expressive-writing condition.) At Time 2, 27 of the 57 participants in the experimental condition were randomly assigned to receive a booster writing session. Twenty of the 40 control participants were randomly assigned to receive a booster writing session.

Participants were offered \$10.00 payment for completion of the 6-month follow-up session. Ninety-two participants (67 women and 25 males) returned at the 6-month follow-up (Time 3). Of those who did not complete follow-up, 4 were in the experimental and 1 was in the control condition. Finally, the data of 2 of these participants were excluded from data analyses, as described in the Results section.

MEASURES

The Beck Depression Inventory (BDI; Beck et al., 1979). This 21-item inventory was used to measure participants' level of depression. It is a widely used self-report measure with high internal consistency (average coefficient alpha = .81), high concurrent validity (clinical ratings: $r = .60$; MMPI-D: $r = .60$), high temporal stability ($r = .83$), and high construct validity in that it measures many symptoms considered to be indicative of depression (Beck, Steer, & Garbin, 1988).

Inventory to Diagnose Depression–Lifetime Version (IDD-L; Zimmerman & Coryell, 1987). This 22-item inventory was used to diagnose lifetime history of depression among participants. The IDD-L has good internal consistency (Cronbach's alpha = .92) and split-half reliability (Spearman-Brown coefficient = .90). Using clinical

ratings as a criterion measure, the IDD-L has been demonstrated to have good sensitivity (74%) and specificity (93%), with an acceptable level of agreement between the inventory and the clinical rating ($\kappa = .60$) (Zimmerman & Coryell, 1987). This inventory was used during pretesting to screen potential participants.

Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991). This 22-item subscale of the Response Styles Questionnaire assesses responses to depressed mood that are focused on the self, on symptoms, and possible causes and consequences of mood. Its internal consistency is reported to be high (Cronbach's $\alpha = .89$), and it has been shown to have significant convergent validity ($r = .62$) with ruminative responses to depressed mood (Nolen-Hoeksema & Morrow, 1991).

Brooding and Reflection Subscale scores were calculated using items identified by Treynor et al. (2003). All five items identified by Treynor et al. as belonging to the Brooding Scale were summed to compute Brooding scores for the present analyses. These were: "Think, 'What am I doing to deserve this?';" "Think, 'Why can't I get going?';" "Think about a recent situation, wishing it had gone better"; "Think, 'Why do I have problems other people don't have?';" "Think, 'Why can't I handle things better?'" At baseline, the Brooding Scale correlated .82 with the RRS total score in the present sample, and internal consistency (Cronbach's α) was .80.

Computation of the Reflection Scale was modified from Treynor et al. because two of their five reflection items made reference to feelings of depression and we deemed this inconsistent with our purpose of identifying a scale that captured attention to distressing emotions unconfounded by depression. Furthermore, Rude et al. (in press) reported a factor analysis in which these two excluded items failed to load on the Reflection factor. The three items that were summed to form the present Reflection Scale were: "Go away by yourself and think about why you feel this way"; "Write down what you are thinking and analyze it"; and "Go someplace alone to think about your feelings." At baseline, this modified Reflection Scale correlated .46 with the RRS total score in the present sample, and internal consistency (Cronbach's α) was .75. For simplicity, we refer to the present scale simply as Reflection but it should be noted that it is not identical to the Reflective Pondering Scale reported by Treynor et al.

Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). This measure assesses individuals' emotion-regulation practices on two distinct dimen-

sions: suppression and reappraisal. Although the full, 10-item scale was administered, only the 4-item Suppression Scale was of interest. Participants indicate their agreement with suppression items such as, "I keep my emotions to myself" and "I control my emotions by not expressing them," on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). Gross and John reported coefficient alpha reliabilities averaging .79 for the Reappraisal Scale and .73 for the Suppression Scale and test-retest reliabilities of .69 for both scales. Significant discriminant and convergent validity was demonstrated between the ERQ scales and a variety of measures, including rumination, personality, and coping measures (Gross & John, 2003). In the present study, internal consistency (Cronbach's α) for the Suppression Scale, assessed at pretest, was .79.

As can be seen from the sample items, the Suppression Scale assesses suppression of emotional expression rather than suppression of thoughts or emotional experiences, as are assessed by another widely used scale, the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994). The focus of Gross's scale on emotional expression was deemed most relevant to the purposes of the current study since we were interested in the effects of an expressive writing intervention.

Follow-up Questionnaire on Participants' Subjective Experience (FQPSE; Pennebaker, Colder, & Sharp, 1990). At the end of the 6-month assessment session, participants were presented with eight Likert-scale (7-point) questions about their experience in the study. Questions asked how much participants thought about and talked about what they wrote, how happy and sad they had felt since the beginning of the study, how positive or negative the impact of the writing was on them, how meaningful the study was to them, and whether they would participate in the study again. Finally, they were asked to respond to an open-ended question regarding how being in the study had affected them. These questions have been used at the end of prior writing studies (e.g., Pennebaker et al., 1990; Pennebaker & Francis, 1996) to obtain a sense of what subjective benefits participants took from the study.

PROCEDURE

Pretesting and initial assessment (Time 1). As part of on-line pretesting, participants completed the BDI and IDD-L. Eligible persons were contacted and scheduled for individual initial sessions by email. Upon arrival at the lab, participants first completed consent and demographic information forms, and the self-report questionnaires listed above.

Immediately upon completion of self-report measures, participants were randomly assigned to one of the experimental conditions with the constraint of including more participants in the treated group as described above. They were then verbally instructed by the experimenter to start their first writing session. All participants engaged in three consecutive writing sessions for 20 min each on three consecutive days (cf. Pennebaker, 1989, 1997). On Days 2 and 3, participants completed their writing exercise from their own or an on-campus computer on a secure Web server. The Web page displayed both writing instructions and a timer throughout the writing exercise. A written and audible alert notified participants when 20 min had elapsed.

Experimental (expressive) writing instructions. Instructions for the experimental condition were as follows:

For the next 3 days, I would like for you to write about your very deepest thoughts and feelings about any difficult or emotionally disturbing events you are experiencing in your life right now. You may also tie your topic in with any past stressful or traumatic experiences you've had. In your writing, I'd like you to really let go and explore your very deepest emotions and thoughts. You might link your topic to your relationships with others, including parents, lovers, friends, or relatives. You may also want to link your experience to your past, your present, or your future, or to who you have been, who you would like to be, or who you are now. You may write about the same general issues or experiences in all days of writing, or on different experiences each day. Don't worry about grammar or spelling—that is not important. All of your writing will be completely confidential.

Control writing instructions. The instructions for the first control condition writing session were as follows:

For the next 20 minutes, I would like for you to write about how you have used your time over the past 2 weeks. In your writing, please go into as much detail as possible in how you have spent your days and managed your time. In your account of your activities, please be as objective as possible. You should describe your activities in detail without discussing any of your own thoughts or feelings related to the topic.

For the next 2 consecutive days, participants in the control condition were asked to write about how

they used their time within the past 24 hours (Day 2) and how they planned to use their time during the next 2 weeks (Day 3).

Five-week session (Time 2). Five weeks after the initial writing intervention, participants returned to the lab for their first follow-up assessment. Participants again filled out the BDI and measures of emotion regulation. Next, participants in both conditions were randomly assigned to receive a booster session or no booster session. Instructions for the booster sessions paralleled the instructions participants had received previously. That is, participants who had written in the expressive condition were again asked to write about their deepest thoughts and feelings, and participants in the control condition were again asked to write about how they had used their time within the preceding 2 weeks.

Six-month follow-up (Time 3). Participants were contacted by email or phone and offered payment of \$10 to schedule their 6-month follow-up. At this time, participants again filled out the BDI, RRS, ERQ, and the follow-up questionnaire. Upon completion of the measures, participants were paid and debriefed.

Results

SAMPLE CHARACTERISTICS

As described under Methods, 5 of the 97 participants who began the study did not complete the 6-month assessment. In addition, one 64-year-old nontraditional college student from the expressive writing group was excluded from data analyses because of atypical responses and another participant from the control writing group was excluded because his graduation during the course of the study led to substantial portions of his data being missing. Hence, the final sample used for statistical analyses consisted of 90 participants.

The mean age of participants at the start of the study was 19 years, with a standard deviation of 2.13 and a range from ages 18 to 36. Seventy participants (77.8%) were of Anglo origin, 7 (7.8%) were of Asian/Asian-American/Pacific Islander origin, 11 (12.2%) were Latino/Hispanic, and 2 (2.2%) indicated "other" as their ethnicity. Eight participants (8.9%) indicated that English was their second language.

MANIPULATION CHECK

Participants' responses to the follow-up questionnaire, FQPSE, served as a manipulation check for the writing instructions. Analyses of responses indicated that participants in the expressive writing condition reported "thinking about" what they

wrote, and “talking to other people” about what they wrote, more than those in the control condition; $t(88) = 2.40, p = .02, t(88) = 1.94, p = .06$, respectively. Participants in the expressive writing condition also reported that they would be “more likely to participate in this study in the future,” $t(88) = 2.37, p = .02$. No significant group differences were found on any of the remaining five questions (how happy and sad participants had felt since the beginning of the study, how positive or negative the impact of the writing was on them, and how meaningful the study was to them). In all but the last of these comparisons, $t(88) < 1$. The comparison for rated meaningfulness of the study was also nonsignificant, $t(88) = 1.20, p = .23$.

Participants' essays in the experimental condition reflected a wide variety of stress and trauma. Topics included relationship problems (52.1%), academic problems (30.7%), adjustment to college and loneliness (20.7%), family problems (20.7%), concerns about mental or physical health (13.6%), body image concerns and eating disorders (11.4%), bereavement (7.1%), pregnancy and abortion concerns (2.9%), concerns around illegal activities (e.g., drugs) (2.9%), rape victimization (1.4%), abuse victimization (0.7%), and other miscellaneous topics (e.g., housing problems, financial problems, 21.4%).

EFFECTS OF WRITING ON DEPRESSIVE SYMPTOMS

The primary interest of this study was in whether expressive writing, compared to control writing, would result in lower depression symptoms for depression-vulnerable college students. In addition, the study explored whether benefits would be greater among high suppressors and whether they would be enhanced by a booster session. Finally, the study was designed to explore a possible mechanism of effect for expressive writing. The interest was in whether changes in brooding rumination due to expressive writing might mediate changes in depression symptoms.

For the analyses addressing these questions, residual change scores were created for depression and for each of the rumination scales. So, for example, a Time 2 (5-week) residual depression change score was created by regressing Time 2 BDI scores onto Time 1 BDI scores, and a Time 3 (6-month) residual depression change score was created by regressing Time 3 BDI scores onto Time 1 BDI scores. This analytic approach is very similar to the use of pretest scores as covariates (cf. Kerlinger & Pedhazur, 1973). It was used here because it reduces the number of covariates

in the mediation analyses and thereby facilitates interpretation.

A median split on participants' scores on the Suppression Subscale of the ERQ at Time 1 was used to create groups high and low in level of suppression. Means (and standard deviations) for high and low suppressors were 17.69 (3.69) and 9.24 (2.72), respectively. However, high and low suppressors were not significantly different in their baseline BDI scores, either overall, $t(88) < 1$, or within the experimental or control conditions; $t(50) = 1.09, p = .28$, and $t(36) < 1$, respectively). Similarly, high and low suppressors were not significantly different in their baseline RRS Brooding and Reflection scores. This was true both overall ($df = 88$), and within the experimental ($df = 50$) and control conditions ($df = 36$); each $t < 1$. The high and low suppression groups were also equivalent in terms of the male/female breakdown, both overall and within the experimental and control conditions, each $X^2 < 1.0$.

Time 2 and Time 3 depression change residuals were examined in separate analyses of variance with writing condition (expressive, control) and suppression (low, high) as factors. Booster condition was dropped from the Time 3 analyses (the only post-booster assessment) because it failed to produce a significant main effect or interactions with writing condition, suppression, or the combination; respectively, $F(1, 82) = 1.33, p = .25; F(1, 82) = 1.76, p = .19; F(1, 82) < 1$.

Analysis of Time 2 depression change failed to yield significant main effects for either writing condition or suppression, each $F(1, 86) < 1$. The interaction of writing condition and suppression was also nonsignificant, $F(1, 86) = 2.58, p = .11$. Analysis of Time-3 depression-change residuals yielded a significant interaction between writing condition and suppression group, $F(1, 86) = 5.48, p < .02$. Neither of the main effects was significant, $F_s < 1$. A follow-up t test of the simple effects of writing condition revealed that participants in the expressive writing group had significantly lower 6-month BDI scores than those in the control group, within the high-suppression group, $t(46) = 2.21, p = .03$. There was no significant difference within the low suppression group, $t(40) = -1.28, p = .21$. Means and standard deviations corresponding to these analyses are shown in Table 1. Correlations among the rumination, suppression, and depression scales are shown in Table 2.

MEDIATION ANALYSES

Since the effect of expressive writing was found only for participants above the median on suppression,

Table 1
Means and standard deviations for depression and rumination scores, according to writing condition and suppression group

	Expressive writing		Control writing	
	Suppression		Suppression	
	Low (n = 28) M (SD)	High (n = 24) M (SD)	Low (n = 14) M (SD)	High (n = 24) M (SD)
BDI 1	5.63 (3.25)	6.58 (2.92)	4.57 (2.95)	5.13 (2.63)
BDI 2	5.46 (4.08)	5.75 (3.76)	3.00 (3.23)	5.13 (3.77)
BDI 3	7.00 (6.30)	4.46 (2.98)	4.21 (4.71)	6.25 (4.78)
Brood 1	3.57 (2.95)	4.04 (3.24)	3.14 (2.60)	2.83 (2.33)
Brood 2	2.82 (2.26)	3.04 (2.05)	2.64 (2.37)	2.79 (1.91)
Brood 3	4.00 (3.51)	2.96 (2.56)	2.86 (3.30)	3.38 (3.49)
Reflect 1	1.29 (1.72)	1.38 (1.72)	1.50 (1.65)	1.08 (1.64)
Reflect 2	1.50 (2.01)	1.50 (2.04)	0.93 (1.33)	1.58 (1.72)
Reflect 3	1.93 (2.07)	1.67 (1.55)	1.43 (1.65)	1.42 (2.10)
BDI2 res	.17 (1.03)	-.09 (1.10)	-.34 (.84)	.09 (.88)
BDI3 res	.27 (1.22)	-.36 (.59)	-.20 (.88)	.17 (1.00)
Brood2 res	-.04 (1.11)	-.02 (1.07)	-.05 (1.02)	.10 (.80)
Brood3 res	.21 (1.25)	-.34 (.87)	-.12 (.86)	.17 (.79)
Ref2 res	.04 (1.12)	.01 (1.14)	-.38 (.75)	.16 (.80)
Ref3 res	.24 (1.12)	-.22 (.93)	-.10 (.95)	-.01 (.93)

Note: BDI = Beck Depression Inventory; Brood and Reflect = subscales of the Ruminative Response Scale. BDI 1, Brood 1, and Reflect 1 were administered immediately prior to the first writing session; BDI 2, Brood 2, and Reflect 2 were administered 5 weeks later, and BDI 3, Brood 3, and Reflect 3 were administered at the 6-month follow up. BDI2 res and BDI3 res are residual BDI 2 and BDI 3, respectively, after regressing these scores separately onto BDI 1. Brood2 res and Brood3 res are residual Brood 2 and Brood 3, respectively, after regressing these scores separately onto Brood 1. Ref2 res and Ref3 res are residual Reflect 2 and Reflect 3, respectively, after regressing these scores separately onto Reflect 1.

mediation analyses were conducted on this subgroup of 48 participants using analytic steps specified by Baron and Kenney (1986). We predicted that reductions in the self-judgmental (brooding) but not the more benign (reflection) dimension of rumination would mediate effects of expressive writing on depression scores.

The first criterion of mediation is that treatment (expressive writing) affects the primary dependent variable (residual depression). This criterion was satisfied as described above. The second criterion is that treatment affects the proposed mediating variable. We tested this criterion first for the Brooding Subscale and found a significant effect of treatment on residual Brooding at Time 3, $F(1,46) = 4.46, p = .04$. The third criterion is that change in the mediating variable is associated with change in the dependent variable. Residual depression was significantly associated with residual Brooding at Time 3, controlling for the effect of treatment, $F(45) = 11.32, p < .002$. The final criterion for mediation is that the impact of the

treatment on the dependent variable drops to zero when the mediating variable is included as a predictor in the analysis. When brooding change was entered as a covariate in the analysis of the effect of writing condition on Time 3 depression change, the effect of writing dropped below statistical significance, $F(1, 45) = 1.78, p = .19$.

As expected, the Reflection Scale did not meet criteria for mediation. There was no significant effect of expressive writing on reflection change, $F(1, 46) < 1$. In addition, residual depression was not associated with residual Reflection, controlling for the effect of treatment, $F(45) = .02, p > .9$.

Discussion

The results of this study support the benefits of expressive writing in lowering depression symptoms for depression-vulnerable college students at a 6-month follow-up. These changes, which were found only among less expressive participants (those with high ERQ Suppression scores), appear to be mediated by changes in RRS Brooding but not Reflection scores.

Although we had not anticipated that benefits of expressive writing would be limited to high-suppressing participants, this finding does mirror results of several prior studies. For example, Paez, Velasco, and Gonzales (1999) and Solano, Donati, Pecci, Persichetti, and Colaci (2003) found benefits of expressive writing only among participants high on an alexithymia scale. And in two separate studies, Langens and Schuler (2005) found that writing about upsetting events was beneficial only for participants high in fear of social rejection. The current results are also consistent with the notion that less expressive individuals had a greater need for the forum provided by the expressive writing treatment.

Examination of comments participants wrote on the follow-up questionnaire at the conclusion of the study bear out the above interpretation. About one third of the high-suppressing participants from the expressive writing condition commented positively on the contrast between their normally taciturn

Table 2
Correlations at baseline

	Brood 1	Reflect 1	ERQ suppression
BDI 1	.51**	.14	.06
Brood 1		.24*	.09
Reflect 1			.02

Note: N = 90. Brood 1 and Reflect 1 = subscales of the Ruminative Response Scale. ERQ Suppression = the Suppression scale of the Emotion Regulation Questionnaire.

* $p < .05$.

** $p < .01$.

style of handling their emotions and the study instructions to write about their feelings. For example, one such participant wrote: "I am very bad at getting emotions out. I certainly don't express them to many people. ... Being forced to sit down and write out my feelings literally changed me." This participant was one of several who volunteered that they had started keeping a journal. Another high-suppressing participant in the expressive writing condition commented, "I know that it is healthy to share feelings with other people, but I rarely do that, so I guess that writing down my thoughts is a positive alternative to keeping everything bottled up inside. So this experiment gave me an outlet." Interestingly, a few of the low-suppressing participants made comments about expressive writing suggesting that it had little added value for them. For example, one woman commented, "Honestly, [the writing] probably didn't influence me that much. I always talk to my friends so that to me is the equivalent of writing so it didn't impact me that much."

It is noteworthy that Suppression scores were not associated with BDI scores, RRS scores, or gender in the present sample, despite the fact that Gross and John (2003) reported modest associations of the Suppression Scale with all these variables. The Suppression scores for men and women in our sample were similar to those reported by Gross and John and the relatively low power in our analysis is a likely cause for the absence of significant gender difference. Mean Suppression scores in the present sample were 3.68 and 3.35 for men and women, respectively, as compared to 3.64 and 3.14 in Gross and John's sample. The absence of significant correlations of Suppression scores with BDI and RRS scores ($r = .06$ and $.07$ [$N = 90$], respectively in the present sample, as compared to $r = .25$ and $.18$ in Gross and John's samples) may be due to our having sampled individuals with a history of elevated depression symptoms. If suppression does indeed confer a degree of vulnerability to depression, it would make sense that the correlations of Suppression with BDI scores would be attenuated in a sample selected for depression vulnerability.

Another noteworthy aspect of the present findings is the evidence they provide that emotional processing is important in lowering subsequent depression symptoms. The fact that expressive writing reduced the brooding but not the reflection aspects of rumination and that brooding but not reflection mediated the impact of expressive writing on depression symptoms is consistent with the notion that negative judgments of emotional

experience are the "active ingredient" in the depressogenic effects of rumination.

Given conflicting evidence in the literature about whether depression-prone individuals err by thinking too much or too little about their problems and distress, the present results not only support the potential utility of attending to and processing negative material; they also suggest that reducing self-judgments about distress may play an important role in facilitating emotional processing. In addition to the direct effects that such self-judgments likely have in producing depressive symptoms, it seems likely that they have an inhibiting effect on emotional processing, preventing individuals from fully accessing the range of potential perspectives and emotional experiences that might otherwise be available to them, and thereby preventing reorganization and resolution of problematic emotional experiences (cf. Greenberg, 2002).

Contrary to expectation, the addition of a "booster" writing session 5 weeks after the initial sessions did not significantly enhance the benefits of expressive writing. The study was quite low in power to test the effect, however, so the null results may simply reflect a lack of power. Further, a meta-analysis by Whisman (1990) indicates only modest effectiveness of booster sessions across a variety of contexts. Yet another possibility is that the potential effect of the booster session was washed out due to the fact that some participants continued to write on their own. On the follow-up questionnaire some participants volunteered that they had begun to keep a journal as a result of their participation in the study.

It is not clear why expressive writing was associated with benefits at the 6-month but not the 5-week assessment points. One of the problems with assessing depression symptom benefits in a sample of currently nondepressed participants is that only a small proportion can be expected to relapse into depression or experience increased symptoms during the follow-up period and the chances of observing variation between treated and untreated participants at any given assessment point is relatively low. It might be that, with the passage of 6 months, more of the participants had occasion to experience the sorts of adverse events that potentiate depression symptoms. A clear limitation of the current study is that few participants in this sample experienced large increases in depressive symptom. The power of the study to detect the effects of expressive writing in preventing depression would be greatly increased by more stringent screening for depression vulnerability, a larger sample, and multiple follow-up assessments over a longer time span.

It is important to note that the relevance of these findings to depression of clinically significant proportions is limited by the fact that the sample was neither selected nor assessed by clinical interview. So, although depressive symptoms were lower in the expressive writing condition, it cannot be assumed that these benefits would extend to the prevention of syndromal depression. It is also worth noting that the study was relatively low in power to detect benefits in preventing depression symptoms. Assessment of a larger sample and a longer follow-up period would have been advantageous. The possible benefits of expressive writing in preventing depression is an important topic for future research to address. Findings of even a modest effect in preventing syndromal depression would have enormously important implications given the brevity and cost-effectiveness of the expressive writing intervention.

Clinical Implications

The expressive writing paradigm has produced clinically meaningful results for both mental and physical health across a variety of populations (Smyth, 1998). The current study is the first to assess its usefulness in lowering subsequent depression symptoms among formerly depressed participants. Findings provide encouraging preliminary support for the utility of expressive writing interventions in preventing depression among relatively inexpressive individuals and point to the importance of judgmental self-focus (brooding) as an active ingredient in maintaining depression symptoms. The findings support the potential clinical utility of an extremely cost-effective intervention—expressive writing—among depression-vulnerable individuals. While writing interventions have proven useful with a wide range of behavioral and health outcomes, only a few studies have examined the utility of expressive writing in alleviating depression symptoms.

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