

Journaling About Stressful Events: Effects of Cognitive Processing and Emotional Expression

Philip M. Ullrich, M.A. and Susan K. Lutgendorf, Ph.D.

University of Iowa

ABSTRACT

The effects of two journaling interventions, one focusing on emotional expression and the other on both cognitive processing and emotional expression, were compared during 1 month of journaling about a stressful or traumatic event. One hundred twenty-two students were randomly assigned to one of three writing conditions: (a) focusing on emotions related to a trauma or stressor, (b) focusing on cognitions and emotions related to a trauma or stressor, or (c) writing factually about media events. Writers focusing on cognitions and emotions developed greater awareness of the positive benefits of the stressful event than the other two groups. This effect was apparently mediated by greater cognitive processing during writing. Writers focusing on emotions alone reported more severe illness symptoms during the study than those in other conditions. This effect appeared to be mediated by a greater focus on negative emotional expression during writing.

(Ann Behav Med 2002, 24(3):244–250)

INTRODUCTION

Writing about personally experienced stressors or traumatic events has been associated with improvements in mental and physical health in numerous investigations. For example, writing about stressful or traumatic events has been related to decreased distress (1) and depression (2), fewer illness-related visits to physicians (3–7), and positive changes in immune function (8,9). A recent meta-analysis of the effects of written disclosure found that writing about stressful or traumatic events is related to improvements in self-reported health, psychological well-being, physiological functioning, and general functioning (10). Moreover, the positive effects of written disclosure appear to be equivalent to or greater than effects produced by other psychosocial interventions (10).

Several theories have been advanced to explain the effects of written disclosure. It has long been believed that the expression of emotion is beneficial to mental health, whereas the inhibition of emotion is harmful (11,12). According to this hypothesis, the inhibition of emotion is considered a chronic stressor that can lead to declines in emotional and physical health. Disclosure is thought to work because it allows for the expression of

emotions and the subsequent release of pathognomonic tension. In addition, it has been proposed that expressing trauma-related emotions in a safe environment enhances feelings of control and mastery over the traumatic event (12). Alternatively, expressing trauma-related emotions may initiate a process of desensitization in which individuals form nonthreatening associations between trauma-related stimuli and emotions (cf. 13). According to these formulations, the influence of emotional expression alone should explain the effects of disclosure.

In contrast, other theorists have posited that the effects of disclosure are best explained by processes that involve both emotional expression and cognitive processing. According to these formulations, emotional and cognitive involvement may play complementary roles in processes associated with adjustment to traumatic events. For example, following a stressful or traumatic event, negative emotions may serve to alert an individual to ways in which the traumatic event has challenged the meaning of his or her subjective world, whereas cognitive work is necessary to restore meaning (14). Similarly, it has been proposed that emotional distress may provide motivation for the deliberate, effortful cognitive work required for positive growth following trauma (14). According to this model, adjustment to stressors may be maximized when coping efforts are balanced between emotional reactions and more deliberate cognitive work (15).

Evidence suggests that some of the effects of written disclosure can be explained by both the emotional expression and cognitive-processing aspects of written disclosure. Pennebaker and Beall (3) compared the effects of three methods of writing about a traumatic event: focusing on only facts, only emotions, or both facts and emotions. Individuals who focused on both facts and emotions demonstrated the greatest improvements in health. A text analysis of six written disclosure studies found that the use of words indicative of cognitive processing were related to better physical but not emotional health (16). In addition, greater use of positive versus negative emotion words was related to better health (16). The extent of cognitive and emotional involvement during verbal disclosure has been shown to be related to greater resolution of a stressful or traumatic event (17). In contrast, emotional arousal in response to written disclosure may not be a significant predictor of greater understanding of a traumatic event (17). In sum, written disclosure may be most beneficial if the disclosure experience evokes emotional responses while also facilitating cognitive processing. Previous research suggests that the release of inhibited emotions is not the primary mechanism behind the effects of disclosure (3). This study was designed to extend that work by assessing the effects of focusing on both cognitive processing and emotion expression while journaling about a stressful or traumatic event.

We used an experimental design to help clarify the cognitive and emotional mediators through which written disclosure

We are grateful to John Harvey for his assistance in conducting this study. We also thank James Pennebaker for analyses of journals with the Linguistic Inquiry and Word Count program.

Reprint Address: S. K. Lutgendorf, Ph.D., E-11 Seashore Hall, Department of Psychology, University of Iowa, Iowa City, IA 52242. E-mail: susan-lutgendorf@uiowa.edu

© 2002 by The Society of Behavioral Medicine.

may contribute to health and well-being. Based on studies indicating greater effects of disclosure over long time periods (10), a written disclosure intervention conducted over the course of a month was used to test elements identified as important predictors of positive outcomes in previous disclosure studies. Specifically, this study compared the effects of two disclosure conditions and a control task. One intervention focused on emotional expression, and another focused on both emotional expression and cognitive processing during the disclosure of personally experienced stressful or traumatic events. These two writing conditions were chosen as representative of the principal theories regarding the effects of disclosure. The control task was to write factually about trauma-related events in the media.

We predicted that individuals encouraged to focus on both emotional expression and cognitive processing when writing about a personally experienced stressful or traumatic event would experience greater awareness of the positive benefits of the stressful event and would report less physical illness than individuals encouraged to focus on only the emotional aspects of a stressful or traumatic event or individuals writing about media events. In addition, change in writing content was examined as a mediator of the effects of written disclosure.

METHOD

Participants

Participants were undergraduate psychology students who received course credit for enrolling in the study. Participants were randomly assigned to one of three experimental groups: 60 students in the emotional expression group (Study Group 1), 63 students in the cognitions and emotions group (Study Group 2), and 52 students in the control group (Study Group 3). Of the 175 students who initially agreed to participate in the study, 53 (30%) either did not return journals or did not return to complete the second set of questionnaires, leaving 122 participants (70%) who completed both sets of questionnaires and 1 month of journal entries. The experimental groups did not differ significantly on the rate of dropouts. A series of one-way analyses of variance (ANOVAs) were conducted to determine whether participants who had completed all study procedures differed from those who had not completed all study procedures on important baseline measures. No significant baseline differences between completers and noncompleters were found in number of illness episodes, $F(1, 173) = .12, ns$; severity of illness symptoms, $F(1, 173) = .19, ns$; or positive growth, $F(1, 173) = .04, ns$.

At study end, there were 41 participants in the emotional expression group, 47 participants in the cognitions and emotions group, and 34 participants in the control group. The final sample was composed of 38% men and 62% women, with an average age of 20.05 years ($SD = 2.4$). The experimental groups were not significantly different in mean age or proportion of men versus women. Men and women did not differ significantly on baseline or postexperiment measures of positive growth, $F(1, 121) = .98, ns$; illness episodes, $F(1, 121) = .09, ns$; or severity $F(1, 121) = .15, ns$. Among those participants who completed all procedures, there were no significant dif-

ferences between study groups on baseline measures of number of illness episodes, $F(2, 120) = .78, ns$; severity of illness symptoms, $F(2, 120) = 1.34, ns$; or positive growth from trauma, $F(2, 120) = 1.14, ns$. All of the study analyses included both men and women, using data from participants who had completed journals and both sets of questionnaires.

Measures

Positive growth from trauma. The Posttraumatic Growth Inventory (PTGI) (18) is a 21-item scale used to assess perceived benefits that emerge from coping with a traumatic or stressful event. Benefits include improved interpersonal relationships, new possibilities for the future, greater personal strength, spiritual development, and greater appreciation for life (18). For this study, participants were asked to endorse PTGI items with respect to a previously experienced trauma or stressor that continues to be a source of distress for them. They were asked to select the same trauma or stressor for both administrations of the instrument. This scale was shown to have internal consistency in this study ($\alpha = .91$). Previous research has demonstrated acceptable test-retest reliability ($\alpha = .71$) and high concurrent and discriminant validity (18). The PTGI was administered before and after the journaling intervention to assess change over time in the extent to which participants feel they have experienced positive growth with respect to their trauma or stressor.

Infectious illness episodes and symptom severity. This is a 13-item questionnaire used to assess infectious illness episodes and symptoms (19). Assessments of infectious illness using this measure and physician diagnosis of infection have been shown to agree in 83% of cases (19). The measure assesses the dates, duration, and frequency during the past month of various symptoms commonly associated with infectious illness. Examples of symptoms include temperature greater than 100 °F, sore throat, nasal congestion, and coughing up heavy phlegm. Each symptom is assigned a severity score from 1 to 3 according to the probability that it is indicative of an infectious illness. A total symptom severity score is calculated by summing the severity scores. In addition, the number of illness episodes is calculated by matching clusters of symptoms by date. A cluster of symptoms was considered an episode of infectious illness if the total severity score was 3 or more. This questionnaire was administered before and after the journaling intervention to assess change over time in illness symptom severity and number of illness episodes. In this study, the measure was shown to have adequate reliability with a Cronbach's alpha of .76.

Writing content. The Linguistic Inquiry and Word Count program (LIWC) (20) is a text analysis program that searches text files and computes the percentage of words in 61 content categories judged to reflect the content of a writing sample. The LIWC program computes figures such as the total number of words, number of sentences, percentage of negative and positive emotion words, and percentage of words referring to causation

and insight. As an indication of the reliability of the LIWC program, independent judges have been shown to agree on the content category placements of 93% to 98% of the 2,100 words in the LIWC dictionary files (20). As a demonstration of external validity, Pennebaker and Francis (21) showed that judges' ratings of the content categories of writing samples are highly correlated with LIWC computations of content categories such as negative emotion ($r = .75$), positive emotion ($r = .63$), and insight ($r = .73$).

Because the focus of this study was on cognitive processing and emotional expression, the specific LIWC categories analyzed were as follows: negative emotion words (e.g., *hate*, *worthless*), positive emotion words (e.g., *happy*, *good*), and use of words reflecting cognitive processing (e.g., *cause*, *know*, *ought*). In this study, LIWC-based content category scores served two purposes. First, LIWC scores were used as a manipulation check to determine whether the interventions affected journal content. For the purpose of cognitive processing, negative and positive emotion word scores were chosen to provide assessments of cognitive processing versus emotional expression in journals across study groups. Second, LIWC scores were used as indexes of journal content in analyses of the effects of written disclosure. For this purpose, changes in LIWC scores over the course of journaling were used because such changes, rather than raw scores, have been shown to be important predictors of positive outcomes in prior research (16). Changes in LIWC scores were thought to be indicative of developments in participants' ways of understanding and perceiving personal stressors. Scores reflecting changes in journal content were computed by subtracting mean word use scores from the first half of the journal entries from mean word use scores from the second half of the journal entries. Therefore, higher change scores indicate an increase in the use of a particular word category.

Procedures

Participants completed a consent form and a questionnaire packet during a regularly scheduled class period. After completing the questionnaires, each participant received a journaling assignment to be completed at home during the next month and to be turned in during class at the end of the semester. Participants were instructed to write at least twice a week for at least 10 min following guidelines according to their study groups. Participants in Groups 1 and 2 were instructed to write about the stressful or traumatic topic that they had selected for completing the PTGI questionnaire, that is, a previously experienced trauma or stressor that continues to be a source of distress. In addition, Study Group 1, the emotional expression group, received the following instructions:

We would like you to keep a journal of your deepest feelings about this topic over the next month.

These instructions were intended to increase writers' focus on the emotional aspects of their traumatic events. Study Group 2, the cognitions and emotions group, received the following additional instructions:

We would like you to keep a journal of your deepest thoughts and feelings about this topic over the next month. We are particularly interested in understanding how you have tried to make sense of this situation and what you tell yourself about it to help you deal with it. If the situation you're describing does not yet make sense to you, or it is difficult to deal with, describe how you are trying to understand it, make sense of it, and deal with it and how your feelings may change about it.

These instructions were intended to facilitate cognitive processing of the event, that is, to help make sense of the event and to increase participants' understanding and acceptance of the event. Study Group 3, the control group, received the following additional instructions:

We would like you to keep a journal of events from the media involving loss and trauma over the next month. Your accounts should include what were the facts about the events leading up to the event, what happened, and what was the outcome. Please stick to the facts as much as possible.

Following the month of journaling, participants returned to class to hand in their journal and complete a questionnaire packet identical to the first.

Analyses

As a manipulation check, repeated measures multivariate analysis of variance (MANOVA) procedures, with group as the between-subjects factors and time as the within-subjects factor, were used to examine changes from the first half of journal entries to the second half of journal entries on word use scores. This manipulation check was conducted because of the possibility that the effect of the intervention on journal content might be evident only over time. One-way ANOVAs with post hoc Tukey honestly significant difference tests were used to compare study groups on baseline measures of positive growth (PTGI), illness episodes and illness severity, and amount of journal writing. Changes in health outcomes and positive growth over the course of the study were examined to determine the differential effects of the two intervention groups compared with the control group. Repeated measures MANOVA procedures, with group as the between-subjects factors and time as the within-subjects factor, were used to examine changes over time for all variables. For those variables with significant interactions, within-group follow-up ANOVAs were used to examine changes over time.

Journal content change scores were used to examine associations between changes in journal content and outcomes. These analyses involved partial correlations between change in journal content and illness symptoms and episodes and positive growth while controlling for baseline values of these outcome variables. The control group did not write about personal traumas; therefore, only data from the two experimental groups were used in these analyses. Change in journal content was tested as a mediator of the hypothesized effects of the intervention on outcomes. The recommendations of Baron and Kenny (22) were followed in tests of mediation.

RESULTS

Journal Characteristics

Participants made an average of 8.2 (*SD* = 1.5, range = 5–10) journal entries and wrote an average of 221.09 (*SD* = 167.76, range = 64–1,107) words per entry. An average of more than 8 entries during the 4 weeks of the study indicates that participants followed instructions to write at least twice a week during the 4 weeks. Study groups were not significantly different on number of entries or words per entry. Topics of journals included death of a family member (24%), romantic relationship difficulties (23%), family conflict (14%), academic difficulties (8%), family member with a serious illness (6%), personal physical or mental illness (3%), or more than one of the above topics (14%).

Manipulation Check: Effects of Intervention on Journal Content

A significant Group \times Time interaction was found for cognitive processing, $F(2, 120) = 7.58, p < .01$. Post hoc within-group ANOVAs indicated that cognitive processing significantly increased among the cognitions and emotions group, $F(1, 120) = 28.08, p < .001$. Cognitive processing did not change significantly over the course of the study in either the control group or the emotional expression group. A significant Group \times Time interaction was found for negative emotion, $F(2, 120) = 3.18, p < .05$. Post hoc within-group ANOVAs indicated that negative emotion word use significantly increased among the emotional expression group, $F(1, 120) = 8.64, p < .01$. Negative emotion word use did not change significantly over the course of the study in either the control group or the cognitions and emotions group. Positive emotion word use scores did not change over time in any study groups.

These results suggest that the journaling of the emotional expression group changed over the course of the study to emphasize the expression of negative emotions, whereas the journaling of the cognitions and emotions group changed over the course of the study to emphasize cognitive processing. These results also indicate that the experimental manipulation influenced journaling content in the expected manner.

Effects of Intervention on Positive Growth and Health Outcomes

Changes over time in positive growth are presented in Figure 1. A significant Group \times Time interaction was found for positive growth, $F(2, 120) = 3.71, p < .05$. Post hoc within-group ANOVAs indicated that positive growth significantly increased among the cognitions and emotions group, $F(1, 120) = 4.55, p < .05$. Between Time 1 and Time 2, the mean positive growth score for the cognitions and emotions group increased from 70.68 (*SD* = 20.87) to 75.95 (*SD* = 19.03). Positive growth did not change significantly over the course of the study in either the control group or the emotional expression group.

There was a significant Group \times Time interaction for severity of illness symptoms, $F(2, 120) = 3.34, p < .05$. Post hoc within-group ANOVAs showed that this was caused by an in-

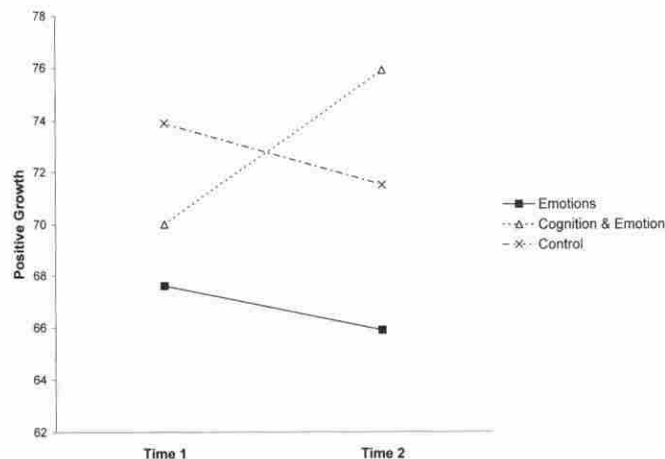


FIGURE 1 Positive growth over time by group.

crease in severity of illness symptoms for the emotional expression group, $F(1, 120) = 3.97, ns$. Between Time 1 and Time 2, the mean illness symptom score for the emotional expression group increased from 3.07 (*SD* = 3.72) to 4.71 (*SD* = 3.6). An increase of this magnitude is equivalent to having had a fever or swollen lymph glands in the month before study enrollment and ending the study having had these symptoms plus a sore throat, runny nose, or coughing in the month during which the study was conducted. In contrast, members of the cognitions and emotions group and the control group reported no significant changes over time in severity of illness symptoms. There were no main effects of group, and no Group \times Time interaction in predicting number of illness episodes. See Figure 2.

Mediation of Positive Growth and Health Outcomes

To examine the associations between journal content and outcomes, partial correlations were performed between change in journal content and positive growth, illness symptoms, and illness episodes at study completion among the cognitions and emotions and the emotional expression groups. These are pre-

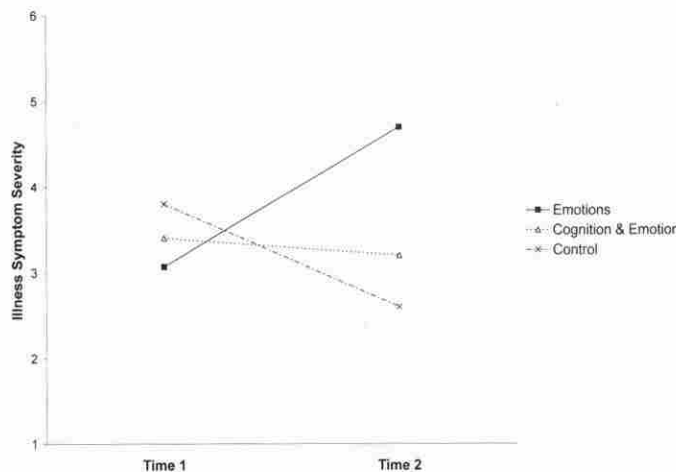


FIGURE 2 Illness symptom severity over time by group.

sented in Table 1. The control group did not write about personal traumas; therefore, only data from the two experimental groups were used in these analyses. Moreover, journal content among the control group was not significantly associated with any outcomes. All partial correlations controlled for the baseline value of the outcome predicted by journal content. Results shown in Table 1 indicate that increases in cognitive-processing words over the course of the study were associated with higher positive growth scores at study completion ($r = .25, p < .05$). In addition, increases in negative emotion word use were associated with greater illness symptom severity at study completion ($r = .27, p < .05$). Neither cognitive-processing nor negative emotion change scores predicted number of illness episodes at study completion.

Next, tests of mediation were performed to examine whether change in cognitive-processing word use mediated effects of the cognitions and emotions group on positive growth. These analyses repeated the MANOVAs reported earlier but controlled for change in journal content to test for mediation. Specifically, repeated measures multivariate analyses of covariance, with group as the between-subjects factors and time as the within-subjects factor, were used to examine changes over time in positive growth while controlling for change in journal content. As indicated earlier, without controlling for change in journal content, these tests showed a significant Group \times Time interaction for positive growth, $F(2, 120) = 3.71, p < .05$. This interaction remained significant when controlling for change in negative emotion word use, $F(1, 120) = 3.79, p < .05$, but became nonsignificant when controlling for change in cognitive-processing word use, $F(1, 120) = 2.26, p > .10$. Moreover, when change in cognitive-processing word use was entered into the equation as a covariate, it was significantly associated with positive growth ($\beta = .22, p < .05$). These findings suggest that increases in cognitive-processing word use appear to partially mediate the increases in positive growth reported by the cognition and emotion group.

A similar set of analyses was used to determine whether change in negative emotion word use in the journals mediated the effects of the emotional expression group on illness symptom severity. As reported earlier, a significant Group \times Time interaction was demonstrated for severity of illness symptoms, $F(2, 120) = 3.34, p < .05$, in tests that did not control for journal content. This interaction remained significant when controlling for change in cognitive-processing word use, $F(1, 120) = 3.61, p$

$< .05$, but became nonsignificant when controlling for change in negative emotion word use, $F(1, 120) = 1.64, p > .20$. In addition, when change in negative emotion word use was entered into the equation as a covariate, it was associated with illness symptom severity ($\beta = .18, p < .05$). These findings suggest that increases in negative emotion word use appear to partially mediate the increases in illness symptom severity among the emotional expression group.

DISCUSSION

We predicted that individuals who journaled about both emotional and cognitive aspects of a personally experienced stressful or traumatic event would experience less physical illness and greater positive growth over time than individuals who focused on only emotional aspects or individuals who wrote about media events. The most important finding of this study was that participants in the cognitions and emotions group reported increases in positive growth from trauma over time, whereas the other two groups showed no change. Participants in the emotional expression group reported more physical illness during the study than those in the other two groups.

The finding of increased positive growth in only the cognitions and emotions group suggests that engagement of both cognitions and emotions while journaling about a stressful or traumatic experience can raise awareness of the benefits of the event. In contrast, focusing solely on the emotional aspects of traumas may not produce a greater understanding of traumatic events. Similarly, the passage of time alone does not seem to facilitate positive growth from a traumatic event. These results are especially relevant for understanding the process of trauma resolution. A body of research has shown that awareness of the benefits of adverse events and circumstances is an important predictor of successful adjustment (23–25). The current findings are consistent with previous research showing that more cognitive and emotional involvement during disclosure is related to increased insight regarding a stressor (17). Similarly, in a bereaved sample, persons who engaged in deliberate, effortful thinking about the death were more likely to experience meaningful shifts in values, priorities, or perspectives in response to the death (26).

The importance of both cognitive and emotional involvement during disclosure may be best understood through formulations of the cognitive processes involved with adaptation to traumatic events. According to these theories, experiencing a traumatic event may be a direct challenge to mental schemas composed of the self, the world, and the future (27,28). Negative effects of traumatic events stem in part from discrepancies between pretrauma mental schemas and trauma-related information (29,30). For example, after experiencing a traumatic event, a person may be faced with the inherently distressing conclusion that the world is unsafe, uncontrollable, and unpredictable. Furthermore, traumatic memories may be stored as unpleasant visual images or physical sensations that are difficult to integrate with existing mental schemas (31,32). When traumatic memories are not organized with other schemas, they may be mani-

TABLE 1
Partial Correlation Coefficients Representing Associations
Between Change in Journal Content and Outcomes Controlling
for Baseline Values of Outcomes

	Positive Growth	Illness Symptoms	Illness Episodes
Cognitive processing	.25*	.02	.06
Negative emotion	.06	.27*	.05
Positive emotion	-.08	.04	-.04

* $p < .05$.

fested later as distressing recollections or reexperiences of the trauma (31,32).

For traumatic distress to be resolved, the discrepant information related to the traumatic event must be incorporated into existing mental schemas (29,30). By incorporating thoughts and emotions related to the traumatic event into existing schemas of the self and the world, an individual gains a coherent explanation of the traumatic event and reactions to the event. Creating a coherent explanation for a traumatic event may help restore self-efficacy and mastery and add meaning to the event. Pennebaker, Mayne, and Francis proposed that these effects may occur through writing about traumatic events (16). Specifically, writing about thoughts and emotions related to a traumatic event translates traumatic images and emotions into a more organized, coherent, and simplified linguistic form. A more structured representation of the event can be assimilated with other schemas and subsequently can reduce distress related to the event. Within this framework, emotional engagement during disclosure may serve to make an individual aware of aspects of traumatic experiences that are discrepant from existing schemas and provide motivation to integrate the experience through cognitive engagement (cf. 14).

Several unanticipated results were found with respect to indexes of physical health. The emotional expression group reported an increase in severity of physical illness symptoms over the course of the study, which appeared to be accounted for by greater negative emotion writing. In addition, neither the cognitions and emotions group nor the control group experienced improvements in physical health. These results were surprising because written disclosure has been shown to have reliable positive effects on reported health and physiological functioning (10). The possible effects of focusing on negative emotions for 1 month may explain why the emotional expression group evidenced declines in health. Other investigators have found that increased use of negative words in written disclosure is related to more illness symptoms and increased number of visits to physicians (15). Furthermore, there is evidence that mood disturbance and a variety of psychological stressors are associated with poorer immune functioning (e.g., 33–36). Although speculative, it is possible that concentration on negative emotions over the duration of the 1-month study may have been associated with mild immune decrements and subsequent poorer health. Alternatively, the emotional expression group may have experienced increased negative affect over time, which could have elicited affect-based over-reporting on the illness symptom measure (cf. 37).

Limitations

Interpretation of these results is limited by small sample size. One reason for the small sample size was the relatively high attrition rate. Thirty percent of participants did not complete study procedures. This high rate of attrition suggests that the utility of long-term journaling as a therapeutic endeavor may be limited. However, it may be that better participation could be found in other populations, such as medical patients or those experiencing acute stressors. This study was unable to examine these possibilities because the sample was composed of college

students who journaled about stressors that varied widely in nature, severity, duration, and time since occurrence. The high attrition rates and other study results may not generalize to populations writing about specific events such as bereavement or coping with a chronic illness.

The instrument used to assess illness episodes and illness symptom severity was phrased to assess these variables in the past month, a time period extending into the time frame of the experimental manipulation. This makes it difficult to be certain when the observed effects of journaling occurred, and it may be possible that this time frame was unable to detect effects that occurred after study completion. Alternatively, a longer term follow-up for measurement of outcomes may have revealed that the observed short-term negative effects of writing lead to long-term beneficial effects.

Certain features of the journaling instructions used in this study raise concerns regarding interpretations of study results. First, demand characteristics may have influenced the results of this study. Specifically, the cognitions and emotions group was provided with more explicit instructions for journaling, which may have led to the expectation and reporting of greater benefits of journaling. This limitation might be avoided in future research by comparing journaling groups receiving equally elaborate instructions. In addition, less reliance on self-report measures for study outcomes might minimize the influence of demand characteristics. The journaling instructions given to the control group also may have had unintended effects. In many disclosure studies, the control group writes about neutral topics such as activities of the day. In this study, the control group was instructed to write about facts related to stories of loss and trauma in the media. Although positive effects were not observed among the control group in this study, it may be that some study results would have been different if the control group had been writing about neutral topics.

Finally, this study was designed to compare the effects of a journaling intervention emphasizing emotional expression to one emphasizing both emotional expression and cognitive processing. Although the results were interpreted as evidence that emotional expression and cognitive processing together may maximize the effects of disclosure, this conclusion remains tentative in the absence of a journaling intervention in which cognitive processing alone is emphasized. Future research might examine how a journaling intervention focusing on thoughts, but not feelings, related to a stressful event compares to a journaling intervention that emphasizes both thoughts and feelings.

CONCLUSIONS

This study indicates that journaling about a personally experienced stressful or traumatic event may facilitate positive growth from the event. However, the focus of journaling is important. Journaling that highlights emotional expression and cognitive processing, that is, efforts to understand and make sense of a traumatic event, may offer greater benefits than journaling focused on the expression of negative emotion. Journaling that focuses on negative emotional expression alone may contribute to increased reporting of physical symptoms.

REFERENCES

- (1) Donnelly DA, Murray EJ: Cognitive and emotional changes in written essays and therapy interventions. *Journal of Social and Clinical Psychology*. 1991, 10:334-350.
- (2) Lepore SJ: Expressive writing moderates the relation between intrusive thoughts and depressive symptoms. *Journal of Personality and Social Psychology*. 1997, 73:1030-1037.
- (3) Pennebaker JW, Beall SK: Confronting a traumatic event: Toward an understanding of inhibition and disease. *Journal of Abnormal Psychology*. 1986, 95:274-281.
- (4) Pennebaker JW, Kiecolt-Glaser JK, Glaser R: Disclosure of traumas and immune function: Health implications for psychotherapy. *Journal of Consulting and Clinical Psychology*. 1988, 56:239-245.
- (5) Pennebaker JW, Colder M, Sharp LK: Accelerating the coping process. *Journal of Personality and Social Psychology*. 1990, 58:528-537.
- (6) Greenberg MA, Stone AA: Emotional disclosure about traumas and its relation to health: Effects of previous disclosure and trauma severity. *Journal of Personality and Social Psychology*. 1992, 63:75-84.
- (7) Greenberg MA, Wortman CB, Stone AA: Emotional expression and physical health: Revising traumatic memories or fostering self-regulation? *Journal of Personality and Social Psychology*. 1996, 71:588-602.
- (8) Esterling BA, Antoni MH, Fletcher MA, Margulies S, Schneiderman N: Emotional disclosure through writing or speaking modulates Epstein-Barr virus antibody titers. *Journal of Consulting and Clinical Psychology*. 1994, 62:130-140.
- (9) Petrie KJ, Booth RJ, Pennebaker JW, Davison KP, Thomas MG: Disclosure of trauma and immune response to a hepatitis B vaccination program. *Journal of Consulting and Clinical Psychology*. 1995, 63:787-792.
- (10) Smyth JM: Written emotional expression: Effect sizes, outcome types, and moderating variables. *Journal of Consulting and Clinical Psychology*. 1998, 66:174-184.
- (11) Rachman SJ: Emotional processing. *Behavior Research and Therapy*. 1980, 18:51-60.
- (12) Scheff TJ: *Catharsis in Healing, Ritual, and Drama*. Berkeley: University of California Press, 1979.
- (13) Lepore SJ, Ragan JD, Jones S: Talking facilitates cognitive-emotional processes of adaptation to an acute stressor. *Journal of Personality and Social Psychology*. 2000, 78:499-508.
- (14) Calhoun LG, Tedeschi RG: Posttraumatic growth: Future Directions. In Tedeschi R, Park C, Calhoun L (eds), *Posttraumatic Growth: Positive Changes in the Aftermath of Crisis*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc., 1998, 1-22.
- (15) Langston CA: Capitalizing on and coping with daily events: Expressive responses to positive events. *Journal of Personality and Social Psychology*. 1994, 67:112-125.
- (16) Pennebaker JW, Mayne TJ, Francis ME: Linguistic predictors of adaptive bereavement. *Journal of Personality and Social Psychology*. 1997, 72:863-871.
- (17) Lutgendorf SK, Antoni MH: Emotional and cognitive processing in a trauma disclosure paradigm. *Cognitive Therapy and Research*. 1999, 23:423-440.
- (18) Tedeschi RG, Calhoun LG: The posttraumatic growth inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*. 1996, 9:455-471.
- (19) Ort K, Sheridan JF, Robinson-Whelen S, et al.: The reliability and validity of a structured interview for the assessment of infectious illness symptoms. *Journal of Behavioral Medicine*. 1995, 18:517-529.
- (20) Francis ME, Pennebaker JW: *LIWC: Linguistic Inquiry and Word Count*, Technical Report. Dallas, TX: Southern Methodist University, 1993.
- (21) Pennebaker JW, Francis ME: Cognitive, emotional, and language processes in disclosure: Physical health and adjustment. *Cognition and Emotion*. 1996, 10:601-626.
- (22) Baron RM, Kenny DA: The moderator-mediator distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*. 1986, 51:1171-1182.
- (23) Affleck G, Tennen H, Croog S, Levine S: Causal attribution, perceived benefits, and morbidity after a heart attack: An 8-year study. *Journal of Consulting and Clinical Psychology*. 1987, 55:29-35.
- (24) Davis CG, Nolen-Hoeksema S, Larson J: Making sense of loss and benefiting from the experience: Two construals of meaning. *Journal of Personality and Social Psychology*. 1998, 75:561-574.
- (25) Mendola R, Tennen H, Affleck G, McCann L, Fitzgerald T: Appraisal and adaptation among women with impaired fertility. *Cognitive Therapy and Research*. 1990, 14:79-93.
- (26) Bower JE, Kemeny ME, Taylor SE, Fahey JL: Cognitive processing, discovery of meaning, CD4 decline, and AIDS-related mortality among bereaved HIV-seropositive men. *Journal of Consulting and Clinical Psychology*. 1998, 66:979-986.
- (27) Hollon SD, Kriss MR: Cognitive factors in clinical research and practice. *Clinical Psychology Review*. 1984, 4:35-76.
- (28) Janoff-Bulman R: Assumptive worlds and the stress of traumatic events: Applications of the schema construct. *Social Cognition*. 1989, 7:113-136.
- (29) Horowitz MJ: *Stress Response Syndromes* (2nd Ed.). New York: Jason Aronson, 1986.
- (30) Foa EB, Steketee G, Rothbaum BO: Behavioral-cognitive conceptualizations of post-traumatic stress disorder. *Behavior Therapy*. 1989, 20:155-176.
- (31) van der Kolk BA: The body keeps the score: Memory and the evolving psychobiology of posttraumatic stress. *Harvard Review of Psychiatry*. 1994, 1:253-265.
- (32) van der Kolk BA, van der Hart O: The intrusive past: The flexibility of memory and the engraving of trauma. *American Imago*. 1991, 48:425-454.
- (33) Herbert TB, Cohen S: Stress and immunity in humans: A meta-analytic review. *Psychosomatic Medicine*. 1993, 55:364-379.
- (34) Kiecolt-Glaser JK, Fisher L, Ogrocki P, et al.: Marital quality, marital disruption, and immune function. *Psychosomatic Medicine*. 1987, 49:13-34.
- (35) O'Leary A: Stress, emotion, and human immune function. *Psychological Bulletin*. 1990, 108:363-382.
- (36) Lutgendorf SK, Antoni MH, Kumar M, Schneiderman N: Changes in cognitive coping strategies predict EBV-antibody titre change following a stressor disclosure induction. *Journal of Psychosomatic Research*. 1994, 38:63-78.
- (37) Costa PT, McCrae RR: Neuroticism, somatic complaints, and disease: Is the bark worse than the bite? *Journal of Personality*. 1987, 55:299-315.

