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HEALTH EFFECTS OF EXPRESSIVE LETTER WRITING

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This study is the first to experimentally examine the potential health benefits of expressive letter writing. College students ($N = 108$) were randomly assigned to one of three letter–writing tasks. Experimental participants wrote a letter to a socially significant other who either helped or hurt them, whereas control participants wrote a letter to a school official regarding an impersonal relational topic. At follow–up, experimental participants reported greater sleep duration and fewer days of illness–related activity restriction compared to controls. In addition, participants who wrote a letter to an offending individual reported better sleep quality relative to controls. Psychosocial outcomes did not vary according to group assignment. Findings point to the potential sleep–related health benefits of expressive writing.

Extensive research has found links between written emotional expression about adverse life experiences and improvement in physical and psychological health. Individuals randomized to write about their deepest thoughts and feelings regarding personal trauma have shown enhanced health and fewer medical visits following writing when compared to those assigned to write about innocuous topics (for reviews, see Frisina, Borod, & Lepore, 2004; Pennebaker, 1997; Smyth, 1998). Results have been replicated in studies of undergraduate and medical students (e.g., Pennebaker, Kiecolt–Glaser, & Glaser, 1988; Petrie, Booth, Pennebaker, Davison, & Thomas, 1995), community–residing adults (e.g., Francis & Pennebaker, 1992; Spera, Buhrfeind, & Pennebaker, 1994), and medical patients (e.g., de Moor et al., 2002; Smyth, Stone, Hurewitz, & Kaell, 1999; Stanton et al., 2002).

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EXPRESSIVE WRITING ABOUT INTIMATE RELATIONSHIPS

Only a few studies have explored interpersonal applications of the written disclosure paradigm, despite the fact that many personal traumatic events occur in the context of intimate relationships (e.g., Koopman et al., 2005; Lepore & Greenberg, 2002; Snyder, Gordon, & Baucom, 2004). For example, Lepore and Greenberg (2002) randomly assigned undergraduates to write about a relationship breakup or impersonal relational topics. Control participants reported short–term increases in upper respiratory symptoms, tension, and fatigue, whereas experimental participants did not. Results indicate that expressive writing may buffer individuals from the negative health outcomes associated with interpersonal stressors. In addition, there was a trend suggesting that experimental participants were more inclined to reunite with their ex–partner relative to control participants. However, the writing intervention did not significantly affect mood states (i.e., depression, anger, vigor) or attitudes and emotions toward the ex–partner.

Although expressive letter writing is widely used by clinicians in an effort to promote forgiveness and reduce distress following relational conflict (e.g., Davidson & Birmingham, 2001; Snyder et al., 2004; Tubman, Montgomery, & Wagner, 2001; White & Murray, 2002), little empirical evidence to date supports the clinical utility of this intervention. For example, undergraduates wrote a letter that described an offense, the offender's motives, and their forgiveness of the offender and then read the letter to workshop attenders (Worthington et al., 2000). Evidence suggested that this intervention by itself did not promote forgiveness of the offender three weeks later, nor did it enhance the effectiveness of an empathy–based forgiveness workshop.

In another experimental investigation, female undergraduates were randomly assigned to write about their thoughts and feelings toward an offender, a close friend, or an acquaintance (Harber & Wenberg, 2005). Increased feelings of closeness toward offenders, but not toward friends or acquaintances, were reported immediately following the writing task. Closeness has been conceptualized as a key index of the forgiveness process because it is negatively related to avoidance motivations and revenge (McCullough et al., 1998).

HEALTH EFFECTS OF EXPRESSIVE WRITING

Researchers have not examined whether expressive writing produces health benefits that may accompany forgiveness, which has been described as "a prosocial change in a victim's thoughts, emotions, and/or behaviors toward a blameworthy transgressor" (McCullough &

Witvliet, 2002, p. 447). Forgiveness has been related to decreased depression (Mauger et al., 1992) and anxiety (Freedman & Enright, 1996) as well as better self–rated physical health (Toussaint, Williams, Musick, & Everson, 2001) and lower cardiovascular stress response (Witvliet, Ludwig, & Vander Laan, 2001). However, these findings should be cautiously interpreted because of the imprecise measurement of forgiveness and the reliance on cross–sectional designs (see Worthington & Scherer, 2004, for a review).

Through the resolution of troubling emotions, expressive writing about interpersonal offenses may advance forgiveness and promote health. Indeed, over two decades of research suggests that written emotional disclosure enhances physical well–being (see Lepore & Smyth, 2002). For example, expressive writing interventions have reduced self–reports of illness symptoms and illness–related activity restriction (Greenberg & Stone, 1992; Pennebaker & Beall, 1986; Smyth, True, & Souto, 2001; Stanton et al., 2002), improved immune functioning (Pennebaker et al., 1988; Petrie et al., 1995), and improved role and physical functioning (Cameron & Nicholls, 1998; Smyth et al., 1999; Spera et al., 1994). However, other studies have failed to show physical health improvement following expressive writing (e.g., Harris, Thoresen, Humphreys, & Faul, 2005; Kloss & Lisman, 2002; Marlo & Wagner, 1999).

Although a meta–analysis suggested that expressive writing did not influence health behaviors such as sleep (Smyth, 1998), a recent study of patients with metastatic renal cell carcinoma found that the expressive writing group reported significantly better sleep outcomes relative to controls (de Moor et al., 2002). Results of another study suggested that patients with fibromyalgia who wrote about trauma experienced significantly reduced fatigue relative to the control groups at a 4–month follow–up (Broderick, Junghaenel, & Schwartz, 2005). However, a study of patients with rheumatoid arthritis and asthma found no effect of expressive writing on sleep outcomes (Stone, Smyth, Kaell, & Hurewitz, 2000). In addition, a study of unemployed professionals did not reveal an effect of expressive writing on reports of difficulty falling asleep (Spera et al., 1994). Thus, the potential sleep effects of expressive writing deserve further exploration.

POSITIVELY FOCUSED EXPRESSIVE WRITING

Most expressive writing research has explored potential health effects without examining the impact of subject valence on these outcomes. Three experiments have shown that writing about the positive aspects of personal trauma or illness results in fewer medical visits or symptoms

compared to controls (Danoff–Burg, Agee, Romanoff, Kremer, & Strosberg, 2006; King & Miner, 2000; Stanton et al., 2002), and two studies that included writing about positive and negative life events have yielded mixed health outcomes (Kloss & Lisman, 2002; Marlo & Wagner, 1999). Marlo and Wagner (1999) randomly assigned undergraduates to write about their most positive life events, their most negative life events, or neutral topics. Although their physical health was not affected, participants in the positively focused writing condition showed the greatest improvement in psychological health, followed by the control condition and the negatively focused writing condition. Kloss and Lisman (2002) found no differences in psychological or physical health at follow–up among undergraduates who wrote about their happiest experiences, their most traumatic experiences, or yesterday's activities.

However, other research suggests that writing about only positive life events (Burton & King, 2004) or future goals (Austenfeld, Paolo, & Stanton, 2006; King, 2001) may be health enhancing. For example, Burton and King (2004) randomly assigned undergraduates to write about an intensely positive life experience or a control topic. Writing about a positive life experience resulted in greater positive mood immediately following writing and fewer medical visits for illness at the 3–month follow–up relative to controls. Many participants in studies that included positively focused writing chose a relational topic (e.g., Burton & King, 2004; Kloss & Lisman, 2002). However, these participants did not write in a letter format.

PURPOSE OF THE PRESENT STUDY

The present experiment extends previous research by examining the potential health effects of writing letters regarding positive and negative relational experiences. This study included an experimental group that wrote a letter to a socially significant other (i.e., friend, relative, or romantic partner) who hurt them and an experimental group that wrote a letter to a socially significant other who helped them. Control participants wrote a letter to a school official about an impersonal relational topic. We hypothesized that at follow–up, the experimental groups would show superior health outcomes relative to the control group. Specifically, both experimental tasks were expected to result in longer sleep duration, better sleep quality, and fewer days of illness–related activity restriction compared to controls based on prior expressive writing research (Broderick et al., 2005; de Moor et al., 2002; Smyth et al., 2001). In addition, both experimental tasks were expected to result in superior psychological health relative to controls based on previous theory and research (e.g., King, 2002; Smyth, 1998).

Efforts to examine the potential relational effects of expressive writing are in their early phases (Harber & Wenberg, 2005; Lepore & Greenberg, 2002; Snyder et al., 2004; Worthington et al., 2000). Thus, exploratory analyses were conducted to evaluate the potential effect of writing group assignment on perceived social support. In addition, for the negatively focused writing group, change from post–writing to follow–up in the desire to gain revenge and to avoid and forgive the offender was assessed. Some studies have found that expressive writing reduces intrusive thoughts about stressful experiences (Klein & Boals, 2001; Sloan & Marx, 2004), whereas other studies have not (Lepore, 1997; Lepore & Greenberg, 2002). Thus, exploratory analyses for both experimental groups were conducted to examine change in the frequency of thoughts regarding the individual to whom the letter was addressed.

METHOD

PARTICIPANTS

A total of 120 undergraduate students (64.2% female) were recruited from the psychology department research participant pool at a state university in the northeastern United States. To be eligible to participate, students had to be able to write by hand, in English, for up to 25 minutes. Participants ranged in age from 17 to 38 years ($M = 18.51$, $SD = 2.18$) and reported the following racial/ethnic backgrounds: Caucasian/White, 70.8%; Asian/Pacific Islander, 10.8%; African–American/Black, 9.2%; Latino/a/Hispanic, 6.7%; other, 2.5%.

Attrition occurred during data collection such that of the original 120 students who completed baseline questionnaires, twelve did not return to complete the writing task and subsequently were excluded from the data set. Of the 108 who did complete the writing task, 88.9% ($n = 96$) returned to complete the one–month follow–up questionnaire. Completion of the follow–up questionnaire did not vary as a function of group assignment, gender, baseline values of the dependent variables, or post–writing affect.

PROCEDURE

After providing written informed consent and completing a baseline questionnaire, participants were asked to return in two days to complete a writing session. During the writing session, participants received envelopes containing instructions that randomly assigned them to one of three conditions: positively focused letter writing ($n = 35$), negatively focused letter writing ($n = 36$), or control letter writing ($n = 37$). After com-

pleting a pre–writing measure of positive and negative affect, participants were asked to write continuously for 25 minutes in accordance with their assigned instructions. Consistent with expressive writing procedures used in several previous studies (Greenberg, Wortman, & Stone, 1996; Lepore, 1997; Smyth et al., 2001), participants wrote on only one occasion. These procedures all took place within the laboratory in small groups spaced adequately within the room so that privacy during the experiment was protected.

Instructions for the negatively focused writing group asked participants to "write a letter to a friend, relative, or significant other who hurt or upset [them]." Identical instructions were provided for the positively focused writing group, except that participants wrote a letter to a person who "helped or supported" them. Instructions for both experimental groups were based on those of Pennebaker (1989) and encouraged participants to "let go and express [their] deepest thoughts and feelings" relating to their "upsetting" or "supportive" experience. Participants in the control group were asked to write a letter to a school official about an impersonal relational topic. Lepore and Greenberg's (2002, p. 552) instructions were utilized: "Should men and women be allowed to cohabitate in the same dormitory or dormitory room? Try to develop rational, or logical, arguments and do not express your feelings or emotional reactions to this issue." To protect anonymity, all participants were instructed to refrain from writing their name and the first and last names of individuals.

Following the writing session, participants completed a measure of positive and negative affect and essay evaluation items. In addition, both experimental groups completed a measure of the frequency of their thoughts regarding the individual to whom the letter was addressed during the past month. The negatively focused writing group completed measures of avoidance, revenge, and forgiveness. Participants anonymously returned their essays and post–writing questionnaires in envelopes to the experimenter. Subsequently, participants were given the option of requesting copies of their letters. Across all experimental sessions, seven participants requested copies. Respondents returned one month later to complete a follow–up questionnaire that repeated the dependent measures that had been assessed at baseline and the post–writing measures for the experimental groups.

MEASURES

Positive and Negative Affect. Participants completed the 37–item version of the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971; Shacham, 1983) immediately before and after writing as a measure

of affective change across the writing session. In addition, this measure was completed with reference to their emotions during the past seven days at baseline and at follow–up. Participants rated their experience of positive (e.g., cheerful) and negative (e.g., sad) affective states on a scale from 0 (*not at all*) to 4 (*extremely*). Consistent with prior research (e.g., Stanton et al., 1998; Stanton et al., 2000), an index of negative affect (NA) was computed by summing items on the Anger, Depression, Tension, Fatigue, and Confusion subscales. The Vigor subscale was used to indicate positive affect (PA). Subscales have been found to be highly correlated with the original POMS subscales (rs > .95; Shacham, 1983). In this study, internal consistency reliability for the NA scale ranged from .93 to .96 at all assessment points, whereas internal consistency for the PA scale ranged from .84 to .88.

Essay Ratings. Immediately following writing, participants rated their own essays as to how emotional and personally meaningful they were, on 5–point scales from 1 (*not at all*) to 5 (*extremely*).

Sleep Outcomes. The Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) evaluates sleep quality and disturbances during the past month. Nineteen items generate seven component scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The component scores are summed to yield a global sleep quality score, with higher scores indicating poorer sleep quality. The PSQI has been validated in a number of populations (Carpenter & Andrykowski, 1998). In this study, global sleep quality and average hours of sleep per night were examined. The seven component scores of the PSQI had an overall reliability coefficient of .70 at baseline and .71 at follow–up.

Illness–Related Activity Restriction. Participants responded to the following question: "During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self–care, work, or recreation?"

Social Support. Perceptions of social support were assessed with the 12–item version of the Interpersonal Support Evaluation List (ISEL–12; Cohen & Hoberman, 1983). Each statement (e.g., "I don't often get invited to do things with others") was rated on a scale from 1 (*definitely false*) to 4 (*definitely true*). This scale consists of Appraisal Support, Belonging Support, and Tangible Support subscales, which can be combined to form a total scale as an overall evaluation of perceived support. Internal consistency for the total score in the current research was .85 at baseline and .79 at follow–up.

Avoidance and Revenge. The Transgression–Related Interpersonal Motivations Inventory (TRIM; McCullough et al., 1998) was used to evalu-

ate reactions of participants in the negatively focused writing group to the interpersonal offense. This scale has adequate reliability and validity and consists of an Avoidance subscale (e.g., "I withdraw from him/her") and a Revenge subscale (e.g., "I'll make him/her pay") (McCullough et al., 1998). Participants rated the extent of their agreement with each item on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Internal consistency for the Avoidance subscale was .90 at baseline and .92 at follow–up, and internal consistency for the Revenge subscale was .84 at baseline and .94 at follow–up.

Forgiveness. Participants in the negatively focused writing group completed a 4–item measure (McCullough, Worthington, & Rachal, 1997) that assessed the extent to which they had forgiven the offending individual. The first three items (e.g., "I wish him/her well") were endorsed on a scale that ranged from 0 (*strongly disagree*) to 5 (*strongly agree*). The fourth item ("I have forgiven the person") was endorsed on a scale that ranged from 1 (*I have not at all forgiven*) to 5 (*I have completely forgiven*). The original measure had five items with an internal consistency of .87 (McCullough et al., 1997). However, in this study, one item ("I condemn the person") was deleted from the analyses due to its low or negative correlations with most of the other items and subsequent decrement in the scale's internal reliability. Internal consistency with the deletion of this item was .66 at baseline and .75 at follow–up.

Interpersonal Cognitions. At baseline and follow–up, participants in both experimental groups were asked to rate the extent to which they thought about the individual to whom their letter was addressed during the past month. Responses ranged from 0 (*rarely or none of the time*) to 3 (*most of the time*).

RESULTS

ESSAY CHARACTERISTICS

Participants in the negatively focused writing condition wrote letters to romantic partners (39%), friends (33%), family members (22%), and unclassifiable parties (6%). Topics included the termination of romantic relationships, experiences of parental abuse and neglect, and friends' violation of trust. Participants in the positively focused writing condition wrote letters to friends (43%), family members (37%), romantic partners (11%), teachers (6%), and unclassifiable parties (3%). Participants expressed gratitude to individuals for their love, advice, and help during difficult times.

One–way analysis of variance (ANOVA) was used to examine the effects of group assignment on ratings of personal meaningfulness and

TABLE 1. Means and Standard Deviations of Dependent Variables as a Function of Writing Condition

Outcome Variable	Writing Condition: Negatively Focused Writing Group	Positively Focused Writing Group	Control Group
Personal meaning	3.97 (1.25)	4.26 (.85)	2.22 (.98)
Emotional disclosure	3.94 (.98)	3.74 (.92)	2.30 (1.13)
Sleep duration (hrs.)	7.00 (1.53)	7.01 (1.18)	6.53 (1.38)
Sleep quality	7.43 (5.31)	9.21 (5.56)	11.94 (9.59)
Days of illness–related activity restriction	2.13 (3.52)	2.70 (4.47)	5.34 (7.86)
Positive affect	9.48 (5.28)	12.17 (5.13)	10.29 (5.06)
Negative affect	34.90 (19.53)	36.90 (19.00)	40.91 (29.00)
Social support	43.24 (4.11)	42.14 (4.98)	41.57 (5.48)

Note. Personal meaning and emotional disclosure were rated by participants immediately after writing on a 5–point scale, from 1 (*not at all*) to 5 (*extremely*), whereas the other variables were assessed at follow–up. Standard deviations are in parentheses.

emotionality of the writing. A significant effect was found for personal meaningfulness, $F(2, 105) = 40.98$, $p < .001$, and for emotionality, $F(2, 105) = 28.60$, $p < .001$. The experimental groups rated their essays as more personally meaningful and emotional than did the control group. Means and standard deviations are displayed in Table 1.

POST–WRITING AFFECT

Prior to writing there were no significant differences in PA or NA as a function of group assignment. Change scores for PA and NA were calculated by subtracting pre–writing scores from post–writing scores and were used as a dependent measure of affective change across the writing session. One–way ANOVAs were used to test for the effects of writing on PA and NA change. No significant between–group effects were found for PA change. NA change, however, was found to be significantly different according to group assignment, $F(2, 104) = 6.22$, $p < .01$. Subsequent pairwise comparisons revealed a significant difference between the negatively focused writing group, which showed an increase in NA ($M = 6.34$, $SD = 20.30$), and the positively focused writing group, which showed a reduction in NA ($M = –5.84$, $SD = 12.16$). Neither group significantly differed from the control group ($M = –1.08$, $SD = 9.16$).

TABLE 2. Intercorrelations Among Outcome Variables

Outcome Variable	1	2	3	4	5	6	7
1. Personal meaning							
2. Emotional disclosure	.73**						
3. Sleep duration (hrs.)	–.01	.14					
4. Sleep quality	.03	–.10	–.42**				
5. Days of illness–related activity restriction	.00	–.08	–.30**	.93**			
6. Positive affect	.08	–.06	.22*	–.23*	–.20*		
7. Negative affect	.03	–.03	–.38**	.52**	.42**	–.25*	
8. Social support	.07	.21*	.05	–.18	–.14	.13	–.20

Note. Personal meaning and emotional disclosure were rated by participants immediately after writing, whereas the other variables were assessed at follow–up. *$p < .05$. **$p < .01$.

FOLLOW–UP OUTCOMES

Intercorrelations among outcome variables are shown in Table 2. At follow–up, days of illness–related activity restriction were associated with shorter sleep duration, poorer sleep quality, less positive affect, and greater negative affect. The correlation between days of illness–related activity restriction and sleep quality was high. In addition, shorter sleep duration and poorer sleep quality were associated with less positive and greater negative affect at follow–up. Social support was not significantly correlated with health outcomes.

Linear regression analyses were used to examine the effects of group assignment on health outcomes at the one–month follow–up. Baseline values of the dependent variables were entered on the first step of the equation, and group assignment was entered on the second step. As hypothesized, group assignment predicted sleep duration, $\beta = .22$, $t(88) = 2.33$, $p < .05$, and global sleep quality, $\beta = –.24$, $t(86) = –2.45$, $p < .05$. Although average hours of sleep per night did not significantly differ between the two experimental groups, both means were significantly higher than the mean of the control group (see Table 1). The negatively focused writing group reported significantly better sleep quality compared to the control group; however, the mean sleep quality for both groups did not significantly differ from that of the positively focused writing group. In addition, group assignment predicted days of illness–related activity restriction, $\beta = –.19$, $t(90) = –2.05$, $p < .05$. The experimental groups reported significantly fewer days of illness–related activity restriction relative to the control group.

Regression analyses also were used to examine the effects of group assignment on the follow–up outcomes of PA and NA, controlling for

TABLE 3. Means and Standard Deviations of Relational Outcomes for the Negatively Focused Writing Group

Outcome Variable	Post–writing	Follow–up
Revenge	6.86 (2.59)	6.52 (2.84)
Avoidance	16.62 (7.28)	17.24 (7.68)
Forgiveness	16.83 (4.11)	17.47 (4.61)

Note. Standard deviations are in parentheses.

baseline values of these dependent variables. Contrary to hypotheses, results were not significant. In addition, group assignment did not significantly predict social support at follow–up, controlling for baseline levels of this variable.[1]

Paired samples *t* tests were conducted to evaluate whether the desire to seek revenge and to avoid and forgive the offending individual changed from post–writing to follow–up for the negatively focused writing group. Results were not significant. Means and standard deviations for these variables appear in Table 3.

Finally, paired samples *t* tests were conducted to examine whether the frequency of thoughts regarding the individual to whom the letter was addressed changed from post–writing to follow–up for both experimental groups. The positively focused writing group evidenced a significant increase in thoughts regarding the individual, $t(29) = -16.70$, $p < .001$, (M change = 1.67, $SD = .55$), whereas the negatively focused writing group evidenced a significant decrease in thoughts regarding the individual, $t(28) = 2.91$, $p < .01$, (M change = –.55, $SD = 1.02$).

DISCUSSION

This study is the first to examine the potential health benefits associated with expressive letter writing, which is a common clinical intervention (e.g., Davidson & Birmingham, 2001; Snyder et al., 2004; Tubman et al., 2001; White & Murray, 2002). In addition, this study is one of the first to examine the potential effects of expressive writing on sleep outcomes.

1. Using the method recommended by Baron and Kenny (1986), analyses were conducted to examine whether sleep duration and sleep quality mediated the effect of writing group assignment on days of illness–related activity restriction. Additional analyses examined whether affect and essay characteristics mediated the effects of writing group assignment on health outcomes. The mediators and outcome measures were the follow–up measures with baseline levels controlled. Results were not significant.

As hypothesized, the experimental groups reported longer sleep duration at follow–up (M = 7.0 hours) relative to the control group (M = 6.5 hours). Although reasons for this result are unclear, quantity of sleep is an important outcome variable to consider. A recent study found that lifetime mortality risk relating to sleep quantity was higher for those who sleep an average of eight hours or more each night and for those who average six or less hours; mortality risk was found to be lowest among those who slept an average of seven hours (Kripke, Garfinkel, Wingard, Klauber, & Marler, 2002). Thus, in this study, findings indicate that participants who wrote about positive or negative relational experiences were more likely to be getting an optimally healthy amount of sleep at follow–up than control participants.

Sleep quality outcomes were partially consistent with hypotheses. As expected, the negatively focused writing group reported better sleep quality relative to the control group. However, sleep quality for both of these groups did not differ from that of the positively focused writing group. Only a few published studies have examined effects of expressive writing on sleep; two of the studies linked expressive writing to sleep–related health benefits (Broderick et al., 2005; de Moor et al., 2002), whereas two other studies did not (Spera et al., 1994; Stone et al., 2000). In light of evidence that links sleep–related disturbances to lower academic performance, negative moods, and increased alcohol and tobacco use among college students (e.g., Jean–Louis, von Gizycki, Zizi, & Nunes, 1998; Trockel, Barnes, & Egget, 2000), potential positive effects of expressive writing on sleep deserve further exploration.

Future research should examine psychological and physiological mechanisms that may account for the relation of expressive writing to sleep outcomes. In the present study, the negatively focused writing group may have experienced a decrease in intrusive thoughts related to upsetting interpersonal experiences over time; indeed, thoughts regarding the offender declined from post–writing to follow–up. Fewer intrusive thoughts may be related to a decrease in anxiety that contributes to autonomic arousal (Niederhoffer & Pennebaker, 2002); a decline in autonomic arousal, may, in turn, be associated with sleep–related benefits. In contrast, thoughts regarding the individual to whom the letter was addressed increased from post–writing to follow–up for the positively focused writing group. Although this group reported optimal sleep duration and better sleep quality relative to controls, the latter difference was not statistically significant.

Illness–related activity restriction also varied as a function of group assignment; the experimental groups reported fewer days during which poor mental or physical health restricted their routine activities compared to controls. This finding is consistent with a previous study that

linked expressive writing to less restriction of activities due to physical illness in a college student sample (Smyth et al., 2001). In the present study, illness–related activity restriction was strongly related to sleep quality. Future research needs to replicate these results in a sample experiencing higher rates of mental or physical illness than in a college student sample.

Although the expressive letter writing interventions appeared to affect sleep and daily activities, positive and negative mood did not vary as a function of group assignment at follow–up. However, expressive letter writing appeared to induce short–term decreases in negative affect for the positively focused writing group and short–term increases in negative affect for the negatively focused writing group. Results may have varied if the POMS had not been the sole measure of subjective well being.

Although previous studies have documented long–term positive effects of expressive writing on psychological outcomes (see Smyth, 1998), the present findings are consistent with other evidence that expressive writing may be a more effective intervention for temporarily altering one's mood than for producing long–term changes in psychological health (e.g., Kloss & Lisman, 2002; Marlo & Wagner, 1999; Schwartz & Drotar, 2004). Indeed, several researchers have reported that the effects of expressive writing are more robust with physical outcomes than with psychological outcomes (see reviews by Frisina et al., 2004; Pennebaker, 1989; Smyth, 1998).

Findings of improved sleep and less illness–related activity restriction in the positively focused writing group without increases in negative affect following writing suggest that physical gain need not require psychological pain (King, 2002). Contrary to assumptions of the standard expressive writing paradigm, the present results and other expressive writing experiments (e.g., Burton & King, 2004; Danoff–Burg et al., 2006; King & Miner, 2000) suggest that invoking negative mood is not necessarily a prerequisite for health improvement. However, the present findings parallel a previous study (Stanton et al., 2002) that found a narrow advantage of standard expressive writing over positively focused writing on health–related outcomes. Additional investigations are needed to assess the potency and underlying mechanisms of positively focused interventions relative to interventions that elicit negative emotions. Potential moderating variables include emotional approach coping (Austenfeld et al., 2006; Stanton, Danoff–Burg, Cameron, & Ellis, 1994; Stanton, Kirk, Cameron, & Danoff–Burg, 2000; for a review, see Austenfeld & Stanton, 2004) and cognitive processing (e.g., intrusive thoughts and avoidance; see Lepore & Greenberg, 2002).

In this study, the extent to which written emotional disclosure affects relational outcomes also was explored. Perceived social support did not vary

as a function of writing assignment at follow–up. In addition, from post–writing to follow–up, the negatively focused writing group reported no change in the desire to seek revenge and to avoid and forgive the offender. These results mirror a study that found no effect of a letter writing intervention on forgiveness (Worthington et al., 2000). However, the present findings may have differed if forgiveness motivations had been measured prior to the writing session. For example, Harber and Wenberg (2005) had one expressive writing group rate their feelings of closeness toward an offender before writing about this individual, whereas the other group provided these ratings immediately following writing. Ratings of closeness were significantly higher for the latter group.

In addition to measuring forgiveness at varying time points, integrating standard expressive writing (Pennebaker, 1989) instructions and instructions to move toward forgiving an offender would extend the current findings. Detailed assessment of the interpersonal context and the essay characteristics that may be associated with forgiveness also is warranted. It would also be interesting to test whether giving participants the option of actually sending the letter would strengthen the effects of this exercise.

Limitations of the present investigation should be noted. It may be that the short period of writing (one 25–minute session) and the short time period (one month) between writing and follow–up were not of adequate length for differences to emerge on psychosocial outcome measures. In addition, this study was limited by a reliance on self–report measures. Future research should report objective measures of clinical status. For example, immune system markers (e.g., increase/decrease in ConA and PhA) and physiological measures (e.g., heart rate, skin conductance) could further our understanding of expressive letter writing's effects (see Esterling, Antoni, Fletcher, Marguiles, & Schneiderman, 1994; Petrie et al., 1995; Sloan & Marx, 2004). Finally, we used a college student sample that was relatively homogenous with regard to age and ethnicity, and therefore additional research is needed to determine the generalizability of the results.

Notwithstanding these limitations, the present study is the first to provide evidence of potential health benefits associated with written emotional disclosure to a socially significant other. In addition, results suggest that confronting negative emotions may not be necessary to experience some health gains associated with expressive letter writing. The larger literature on the positive physical and psychological health effects of expressive writing (Smyth, 1998), together with our findings of improved sleep, suggest that further investigation of its clinical utility is warranted.

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