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The Effects of Expressive Writing on Adjustment to HIV

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Previous research suggests that writing about stressful experiences results in better health and psychological well-being. In the present study, a multi-ethnic sample of 79 HIV-positive women and men participated in a structured interview, and wrote about either their deepest thoughts and feelings about living with HIV (expressive writing) or their activities in the last 24 hr (control). Sixty-two participants returned for the 2-month follow-up and 50 returned for the 6-month follow-up interview. Oral fluid samples of beta2-microglobulin were taken at the baseline and follow-up assessments to examine the immunological effects of writing. No effects of writing condition were found, but expressive writing participants who included increasing insight/causation and social words in their writing had better immune function and reported more positive changes at follow-up. Results suggest that cognitive processing and changes in social interactions may be critical to the benefits of writing.

KEYWORDS: expressive writing; cognitive processing; human immunodeficiency virus; health.

INTRODUCTION

HIV is a persisting life-threatening illness that can contribute to adverse psychological adjustment (Kelly *et al.*, 1998; Simoni and Ng, 2000). Persons diagnosed with HIV infection may develop post-traumatic stress disorder in response and develop a comorbid disorder following the onset of PTSD (Kelly *et al.*, 1998). Not only can HIV diagnosis itself be a traumatic incident, but persons living with HIV are additionally confronted by the continuing trauma of stressful life experiences associated with the disease and its progression. HIV related stressors can include confronting one's own mortality, death of a loved one (Kemeny and Dean, 1995), physical limitation, disability (Griffin *et al.*, 1998), stigma, fear of disclosure (Herek and Capitanio, 1999; Lee *et al.*, 2002), and decline in social support (Moneyham *et al.*, 1996). The stress of living with HIV can affect immune function and HIV disease progression (Ironson *et al.*, 1994; Leserman *et al.*, 2002). HIV progression has been linked to higher levels of depression (Ickovics *et al.*, 2001), lower social support, and heightened stress (Leserman *et al.*, 2002).

Among women and men living with HIV and AIDS, women report increased likelihood of poverty and an overall lower quality of life, lower levels of education and income (CDC, 2002), greater burdens of caretaking roles (Ingram and Hutchinson, 1999), and higher anxiety, depression, and traumatic stress (Sikkema *et al.*, 2003). Yet, despite these increased vulnerabilities, both women and men report many positive changes from dealing with HIV and AIDS, including positive changes in health behaviors, greater empathy, increased spirituality and self-understanding, connection to community, and greater appreciation for life and loved ones (Bower *et al.*, 1998; Folkman *et al.*, 1997; Siegel and Schrimshaw, 2000; Updegraff *et al.*, 2002). The benefits and growth that women and men experience can buffer them from psychological distress (Stein *et al.*, 1997; Updegraff *et al.*, 2002) and have positive effects on immune function (Bower *et al.*, 1998). An

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intervention that helps individuals cope with HIV-related stress and facilitates stress-related growth can not only influence psychological adjustment but health outcomes as well.

Research has shown that the expression of the emotions associated with stressful experiences, by writing or talking about them, results in better health and psychological well-being (Lepore, 1997; Park and Blumberg, 2002; Pennebaker, 1993; Pennebaker *et al.*, 1988; Smyth, 1998). These effects have been found for a variety of stressful and traumatic events and for a variety of outcomes, including psychological well-being, rumination, cognitive reappraisal, immune function, self-reported symptoms, and health center visits. Pennebaker (1993) suggests that the benefits of writing and talking about stressful experiences result from cognitive processing, as well as from the expression of emotions. It allows people to confront and work through their experience, and helps them to understand it more thoroughly. It may also influence people's interactions with others, and affect their social lives (Pennebaker, 2004; Pennebaker and Graybeal, 2001).

Internal analyses of participants' writing have examined how individual differences in the way people write influences the benefits of the writing intervention. For example, those whose essays depicted increasing cognitive processing, as operationalized by words implying insight and causation, and those whose essays included moderate expression of negative emotions and high expression of positive emotions, experienced more health benefits from the writing intervention (Pennebaker *et al.*, 1997). In another study within an expressive writing paradigm, depth processing of trauma (as operationalized by cognitive appraisal change, experiential involvement, self-esteem enhancement, and adaptive coping) mediated the relationship between emotional expression and long-term survival of AIDS (O'Cleirigh *et al.*, 2003). For women, depth processing and emotional expression was also related to better immune function. Cognitive processing assessed in verbal interviews has also predicted benefits, such as reduced rumination (Pennebaker *et al.*, 1997), slower CD4 decline, and lower mortality (Bower *et al.*, 1998), suggesting that both verbal and written processing can confer benefits.

Few studies have examined the effects of written expression on health and adjustment for people living with HIV, although one recent study found that expressive writing resulted in increased CD4+ lymphocytes for HIV-infected patients (Petrie *et al.*, 2004). Support for the benefits of expressive writing has come mostly from studies with healthy participants (Park and Blumberg, 2002; Pennebaker, 1993; Pennebaker *et al.*, 1988). However, writing has also been found to have health benefits for people dealing with chronic illnesses, such as asthma and rheumatoid arthritis (Smyth *et al.*, 1999), for women with breast cancer (Stanton *et al.*, 2002), men with prostate cancer (Rosenberg *et al.*, 2002), and patients with metastatic renal cell carcinoma (de Moor *et al.*, 2002). It is important to investigate the benefits of this potentially valuable intervention for people living with HIV. The cognitive processing that occurs in expressive writing can facilitate finding meaning in the struggle with HIV, and have positive effects on emotional adjustment and health for people living with HIV.

There is some evidence that expressive writing may be especially effective in improving adjustment for those who have difficulties in talking about their stressful experiences (Norman *et al.*, 2004; Paez *et al.*, 1999; Rivkin, 2000). Talking about HIV may be difficult because of the stigma associated with HIV, and the rejection and shame that could result from disclosure (Herek and Capitanio, 1999). The decision to disclose one's positive serostatus is often accompanied by worry about burdening family members, about disrupting relationships, about the stigma of HIV, and about discrimination (Chin and Kroesen, 1999; Mason *et al.*, 1995; Simoni *et al.*, 1995). HIV-related stigma and rejection can interfere with coping and result in greater distress (Heckman *et al.*, 2004; Lee *et al.*, 2002). Thus, expressive writing interventions may be especially valuable for people dealing with a stigmatizing experience such as HIV, which is often difficult to discuss with others.

The purpose of the current study was to examine the effects of an expressive writing intervention on the adjustment of women and men living with HIV, and to examine whether men and women respond to the writing intervention in different ways. We hypothesized that writing about one's thoughts and feelings about being HIV-positive would improve people's emotional adjustment to HIV and result in better immune function. In addition, the intervention was expected to result in greater stress-related growth, or positive changes from dealing with HIV. Expressive writing was expected to be most effective for those whose writing indicated increased cognitive processing and high expression of positive emotion. Because writing may prompt changes in social relationships (Pennebaker, 2004; Pennebaker and

Graybeal, 2001), we also examined whether increases in use of social words in the expressive writing exercise predicted benefits. The current study also examined differences in the social environment for HIV-positive women and men, their strengths and vulnerabilities, and the positive and negative changes in their lives from dealing with HIV.

METHODS

Participants

The participants were a multi-ethnic sample of 79 people living with HIV (21 women, 57 men, 1 transgender), screened for literacy. Participants were on average, 42 years old ($SD = 8.06$). Of the participants, 40 (50%) were Black/African American, 10 (12%) were Caucasian, 13 (16%) were Latino/Hispanic, 12 (15%) were Asian/Pacific Islander, and 4 (5%) were multiracial. Of the women, 90% identified as completely heterosexual, and 9% identified as mainly heterosexual. Of the men, 16% identified as completely heterosexual, 3% as mainly heterosexual, 7% as equally homosexual and heterosexual, 21% at mainly homosexual, and 50% as completely homosexual. Of the participants, 6% had not completed high school, 48% had a high school diploma or GED only, 29% had a vocational/technical degree or associates degree, and 16% had a college degree. Participants had known they were HIV-positive for an average of 8.6 years ($SD = 3.94$), and 45% had ever had a diagnosis of AIDS.

Procedures

Participants first took part in a baseline assessment, consisting of a face-to-face structured interview. Participants were then randomly assigned to one of two groups, the Expressive Writing condition or the Control condition. Participants in the Expressive Writing condition were asked to write for 20 min about their deepest thoughts and feelings about being HIV-positive. They were instructed to just let go and express themselves, and dig down to their deepest emotions and thoughts about being HIV-positive and explore them in their writing. Participants in the Control condition were asked to write for 20 min about what they did in the last 24 hr. They were instructed to write in a descriptive and objective way about their day, and to just describe things exactly as they occurred.

After writing for 20 min and giving their writing to the interviewer, participants were given a blank journal containing the instructions for their writing exercise. Participants were asked to take their journal home, to do the writing exercise once a week for the next three weeks, and bring the journal with them to their next interview. Follow-up assessments were conducted 2 and 6 months after the initial assessment. Participants were reimbursed $15 for each of the three assessments and $5 for each of the three at-home writing exercises they completed, for a total of $60. At the end of the study, participants were debriefed, and those in the Control condition received the instructions for the Expressive Writing exercise. The interviews were conducted either at the participant's home, an office at the University, or a private space in a community based organization. Interviews were audiotaped with the participant's consent, to allow transcribing of open-ended responses.

Oral fluid samples (specifically, oral mucosal transudates) of beta2-microglobulin (B2-M) were taken at the baseline and follow-up assessments in order to assess immunological effects of the writing intervention. B2-M is a measure of systemic immune activation that has been shown to be a strong predictor of disease course in HIV (Fahey *et al.*, 1990). Measurement of B2-M in oral mucosal transudates is less invasive and less expensive than drawing blood, and correlates highly with levels of immune activation markers in serum (Nishanian *et al.*, 1998). The oral mucosal transudate samples were collected by placing the Orasure collection device (Epitope, Beaverton, Oregon) between the lower cheek and gum for 3 min. The oral fluid was then transferred into a tube containing preservative buffer and after centrifugation, the OMT transferred into a cyovial and stored at $-70\ ^{\circ}C$ for batch testing. All specimen of the same subjects were analyzed in the same run to minimize the assay variability using procedures described in Nishanian *et al.* (1998). B2-M levels were measured by using the IMx automated microparticle enzyme immunoassay system and following the manufacturer's instructions (Abbott) for IMx B2-M.

Participants' writing samples were typed and coded using Pennebaker's computerized text analysis program, Linguistic Inquiry and Word Count (LIWC, Francis and Pennebaker, 1993; Pennebaker and Francis, 1996). This program searches the text for percentage of negative emotion words, positive emotion words, social words, and words implying causation (i.e., cause, effect, reason, because), and insight (i.e., realize, understand, think, consider). Mean

scores for each of these categories were computed over all the writing days. In addition, change scores from earlier to later writings were computed.

Measures

The baseline interview included assessment of demographics, including ethnicity, gender, age, education, sexual orientation, marital/relationship status, and number of children. Participants also reported when they first found out that they were HIV-positive. Disclosure and social support were assessed, as well as depression and immune function.

Disclosure, Social Support, and Social Constraints

HIV disclosure, social support, and undermining were assessed through items adapted from the interview for the UCLA-Charles Drew Medical Center Women and Family Project (Wyatt and Chin, 1999). Participants were asked to think of the four most important people in their life, indicate whether they have told each of these people of their HIV status, and whether any of them have ever rejected them because of their HIV status. Participants rated how much each of the four most important people in their life provided emotional support (i.e., listening, showing that they care), informational support (i.e., advice), and instrumental support (i.e., help with specific problems), as well as how satisfied they were with the support they received. Vinokur and Van Ryn's (1993) Social Undermining Scale assessed the extent to which each of the four most important people in participants' lives caused them distress by acting in an unpleasant or angry manner towards them, criticizing them, or making their life difficult. Internal consistencies in the current study were .87 for social support and .80 for social undermining.

Participants also rated those people's attitudes about people with HIV, and about discussions of HIV. They rated the extent to which they talked to those people about their thoughts and feelings about living with HIV, and how comfortable they felt talking to them. Participants also indicated whether they belonged to any support groups or communities that provided support for people with HIV, and rated the extent to which they would talk about their feelings and concerns about HIV to the people in these groups. All ratings of support, undermining, attitudes, and discussion of HIV were made on a scale from 1 to 5.

Depression, Immune Outcomes, and Stress Related Growth

Depression and immune function were assessed at all three time-points. However, the measure of stress related growth (changes from dealing with HIV) was administered only at the follow-up time-points. Talking about these changes can be a therapeutic intervention in and of itself and thus would confound the study if assessed at baseline.

Participants rated their depression symptoms over the past month by completing The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), a commonly used measure of depression that includes four factors: Dysphoria, Positive Affect, a Somatic factor, and an Interpersonal factor (Radloff, 1977; Zich *et al.*, 1990), alpha = .93.

Items from the interview for the UCLA-Charles Drew Women and Family Project (Wyatt and Chin, 1999) were adapted to assess changes in meaning and perceived benefits. Participants were asked how, if at all, being HIV-positive changed the way they think about themselves, changed them as a person, changed the way they are with other people, and changed their priorities. Categories of changes for coding were developed by reviewing the literature and developing additional categories based on an initial analysis of 14 participants' responses. This yielded 10 categories of positive changes, 6 categories of negative changes, and 3 categories of mixed or neutral changes, as well as codes for uncategorized positive and negative changes. Changes were coded by two coders who were blind to the condition participants were randomized to. Those ratings for which there was disagreement were discussed with a third coder until consensus was reached. Inter-rater reliability for valence of the changes described (positive, negative, or neutral/mixed) was 93%. In the specific 19 categories of changes, inter-rater reliability was 66%. The number of changes falling into the positive categories and negative categories was computed for each participant.

Perceptions of Writing

The two month follow-up assessment included manipulation checks and post-intervention questions devised by Donnelly and Murray (1991) and

Pennebaker (i.e. Pennebaker *et al.*, 1988). All responses were rated on 7-point scales with labeled endpoints. Participants rated their responses to the writing, including changes in feelings, changes in self-esteem, and cognitive and behavioral changes resulting from the writing they did. Participants also rated the extent to which the writing exercise they did was valuable for them, the extent to which their writing was personal and emotional, and the extent to which they wrote about something that they had previously held back from discussing with others. This served as a manipulation check as treatment participants were specifically asked to write about their deepest thoughts and feelings.

RESULTS

Of the 79 participants who completed the baseline interview, 62 (78%) returned for the 2-month follow-up session, and 50 (63%) returned for the 6-month follow-up session. Participants who returned to the 2-month follow-up had higher education compared with those who dropped out (Ms = 13.23 and 12.18 years, respectively), $t(75) = 2.41$, $p < .05$, and had higher word counts on their baseline writing exercises (Ms = 302.13 and 206.93 words, respectively), $t(75) = 3.02$, $p < .01$. However, there were no differences between completers and drop-outs in age, gender, ethnicity, length of diagnosis, native language, whether participants were born in the U.S., years in the U.S., depression or B2-M immune function. Of the 62 participants returning for the 2-month follow-up session, 47 had completed all four of the writing exercises, 10 had completed three of the four writing exercises, and 5 had completed only the initial writing exercise. Of the 57 participants who completed at least three writing exercises, 56% reported completing them on an approximately weekly basis (5–9 days apart), 26% had longer spacing between writing exercises, 4% had shorter spacing between writing exercises, 7% had both shorter and longer spacings between sets of writings, and 7% did not include the dates on their writings. Participants' writings included an average of 248 words, with no significant differences between the two conditions. The number of times participants completed the writing exercise did not differ between the two writing conditions. There were no significant differences between the two conditions in demographics, length of diagnosis, or baseline scores on depression, social support, or immune function.

Descriptive Analyses

Social Support and Acceptance

Participants were asked to rate support and acceptance on a 5-point scale from the four most important people in their lives. Participants reported high levels of social support ($M = 3.96$, $SD = .63$) from the people in their social network, high satisfaction with support ($M = 4.11$, $SD = 80$) and low levels of social undermining ($M = 1.58$, $SD = .50$). Many reported that the acceptance level among their social network of people living with HIV was between very accepting and somewhat accepting, ($M = 1.60$; $SD = .67$). Many also reported that they talked a moderate amount to the people in their social network about their feelings and concerns about HIV ($M = 3.08$, $SD = 1.09$), and felt moderately to quite comfortable talking to them about their HIV-related concerns ($M = 3.59$, $SD = 1.06$). However, 13% of the participants reported having been rejected by important people in their lives because of their HIV. Eighty two percent of the participants belonged to support groups or community based organizations providing support for people with HIV, and 88% of these participants said they could talk quite a bit or a great deal to the people in these groups about their HIV-related feelings and concerns.

Positive and Negative Changes from Dealing with HIV

In the qualitative interviews on positive and negative changes they experienced from dealing with HIV, participants reported about three times as many positive changes ($M = 3.43$, $Mdn = 4$) as they did negative changes ($M = 1.28$, $Mdn = 1$). As shown in Table I, the most commonly reported positive changes were in relationships, health behavior changes, and greater appreciation of life, as well as increased sense of personal strength, self-awareness, compassion, and spirituality. The most commonly reported negative changes included negative emotional and coping changes, negative relationship changes, and stigma. Participants also described changes that had mixed positive and negative

Table I. Percent of Respondents Describing Positive and Negative Changes from Dealing with HIV

	2-Month follow-up	*N* (of 60)	6-Month follow-up	*N* (of 50)
Positive Changes				
Strength/coping	35%	21	32%	16
Awareness	32%	19	30%	15
Positive health behaviors	42%	25	42%	21
Education and advocacy	20%	12	20%	10
Positive relationship changes	48%	29	50%	25
Compassion	38%	23	42%	21
Assertiveness	22%	13	28%	14
Appreciating life	42%	25	44%	22
Goal focus	22%	13	10%	5
Spirituality	27%	16	24%	12
Uncategorized positive	17%	10	14%	7
Negative changes				
Negative emotion/coping	25%	15	22%	11
Negative physical changes	17%	10	26%	13
Hopelessness	13%	8	02%	1
Negative relationship changes	20%	12	20%	10
Stigma	23%	14	26%	13
Negative sexual effects	17%	10	14%	7
Uncategorized negative	13%	8	10%	5
Mixed changes				
Caution	35%	21	18%	9
Time consciousness	30%	18	32%	16
Accepting HIV	20%	12	10%	5

aspects, such as consciousness of limited time, feeling more cautious, and accepting the reality of HIV.

Differences Between Women and Men Living with HIV

Women in the current sample were more likely than men to have children, 90% versus 23%, $\chi^2(77) = 28.45$, $p < .01$. This difference is most likely a function of sexual orientation: As noted in the participants section, all of the women identified as completely or mainly heterosexual whereas most of the men (72%) identified as completely or mainly homosexual, $\chi^2(76) = 39.9$, $p < .01$. Women in the current sample had significantly lower education ($M = 12.05$ years, $SD = 1.56$) than men ($M = 13.36$ years, $SD = 2.45$), $t(74) = 2.28$, $p < .05$. There were no differences between men and women in proportions of each of the ethnic groups, in relationship status, depression or immune function, AIDS diagnosis, or in reported levels of social support and social undermining. However, women reported feeling more comfortable talking to their network about HIV ($M = 3.96$, $SD = .88$) than men ($M = 3.43$, $SD = 1.09$), $t(75) = 2.01$, $p < .05$. No significant differences were found between women and men in number of positive or negative changes described in the qualitative interview, or in the frequency of specific categories of changes.

Analyses of LIWC categories examined differences in the words that women and men used in their writing samples, as assessed by percentage of social words, emotion words, and cognitive mechanism words included in the writing. Women included significantly more social references than men ($Ms = 9.00$ and 6.25, respectively), $t(75) = 3.47$, $p < .01$, and significantly more references to family ($Ms = 1.03$ and .44), $t(75) = 2.05$, $p < .05$, other people ($Ms = 3.94$ and 2.53), $t(75) = 2.55$, $p < .05$, and humans in general ($Ms = 1.25$ and .67), $t(75) = 3.28$, $p < .01$ than men did. However, there were no significant gender differences in use of emotion or cognition words.

Analyses of Effects of Writing Intervention

Manipulation Checks

Analyses examined the percentage of words from emotional, social, cognitive, and activity LIWC categories between expressive writing and control writing samples, to verify that the expressive writing instructions would elicit expression of thoughts and feelings, whereas control writing instructions

Table II. LIWC Word Categories as a Function of Condition

Dependent measure	Expressive writing		Control writing		
	M	*SD*	*M*	*SD*	$t(df = 75)$
Affect	4.76	1.38	2.84	1.48	5.89***
Positive emotion	2.67	1.21	1.90	1.15	2.83**
Positive feeling	.71	.60	.41	.39	2.62*
Optimism	.68	.44	.40	.43	2.76**
Negative emotion	2.05	.96	.89	.92	5.43***
Anxiety	.51	.43	.19	.35	3.50**
Anger	.54	.49	.20	.21	4.06***
Sadness	.45	.35	.14	.22	4.73***
Cognitive mechanism	7.92	2.07	3.94	1.67	9.23***
Causation	1.41	.81	.60	.60	5.00***
Insight	2.78	1.13	1.27	.83	6.62***
Discrepancy	2.31	1.17	1.04	.76	5.68***
Inhibition	.31	.30	.37	.36	.75
Tentative	2.83	1.12	1.54	.83	5.75***
Certainty	1.33	.75	.85	.67	2.98**
Social	6.54	2.70	7.50	3.86	1.27
Communication	1.32	.78	2.13	1.24	3.39**
Other references	2.69	1.53	3.16	2.15	1.11
Friends	.37	.40	.58	.67	1.72
Family	.48	.60	.73	1.54	.96
Humans	1.06	.71	.57	.69	3.12**
Personal concerns					
Occupation	1.57	.91	1.97	1.05	1.80
School	.27	.36	.60	.63	2.81**
Job	.38	.43	1.02	.80	4.34***
Achievement	1.03	.61	.69	.44	2.85**
Leisure	.89	.70	2.83	1.72	6.41***
Home	.69	.65	2.21	1.49	5.72***
Sports	.06	.10	.25	.44	2.68*
TV	.06	.13	.49	.56	4.52***
Music	.10	.29	.17	.28	1.08
Money	.12	.20	.47	.39	4.84***
Metaphysical	.81	.81	.31	.59	3.12**
Religion	.38	.48	.26	.60	.94
Death	.43	.45	.04	.09	5.22***
Physical	3.37	1.28	3.72	1.95	.94
Body	2.49	1.20	.76	.67	7.92***
Sexual	.87	1.13	.29	.47	2.99**
Eating	.24	.54	1.71	1.10	7.36***
Sleeping	.23	.42	.76	.70	3.95***
Grooming	.05	.13	.67	.79	4.75***

Note. Table entries refer to percentage of words of this category included in the writing samples,
$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

would elicit an objective description of activities. As shown in Table II, expressive writing participants included significantly more affect words, positive emotion words (including positive feeling and optimism words), negative emotion words (including sadness, anger, and anxiety words), and cognitive mechanism words (including causation, insight, discrepancy, tentative, and certainty words) than control writing participants. As expected, control writing participants included more words related to activities like school, job, leisure, home, sports, TV, money, eating, sleeping, and grooming. Expressive writing participants included more achievement related words, words related to metaphysical (life and death) issues, the body, sexuality, and humans than control writing participants. Control writing participants, however, included more communication words (i.e., talk, share, converse).

Analyses also examined differences between conditions in perceptions of the writing exercise. Expressive writing participants were more likely than control writing participants to report that they wrote about was something that they had previously held back from discussing with others ($Ms = 4.58$ and 3.25, respectively), $t(59) = 2.54$, $p < .05$. They were more likely to report that they acted differently as a result of their writing exercise than participants in the control writing condition ($Ms = 3.61$ and 2.64, respectively), $t(59) = 2.09$, $p < .05$. Expressive writing participants tended to rate their writing exercise as more valuable than control participants, ($Ms = 5.61$ and 4.86, respectively), $t(59) = 1.87$, $p = .06$. There were no significant differences between expressive and control writing participants in ratings of the extent to which their writing was personal and emotional ($Ms = 5.97$ and 5.36, respectively), the extent to which they thought differently as a result of the writing exercise ($Ms = 4.73$ and 4.04, respectively), whether their feelings were more positive ($Ms = 4.39$ and 4.29) or negative ($Ms = 1.64$ and 1.79) as a result of the writing exercise, or whether they felt better ($Ms = 5.09$ and 4.36) or worse ($Ms = 1.42$ and 1.46) about themselves as a result of the writing exercise.

Group Differences

Repeated measures analyses of variance were used to test the effects of the writing condition on depression and immune function (B2-M) at the 2-month and 6-month follow-up assessments. Special contrasts were conducted for the condition by time interaction, comparing baseline values to the two follow-up assessments. The analyses included only the 45 participants who had data at all three time points and returned at least three of the four writing exercises (22 expressive writing participants and 23 controls). There were no significant effects of time,

indicating no overall changes in depression or immune function from baseline to follow-up. No condition by time interactions were found. These findings indicated that writing condition had no significant effects on changes in depression and immune function from baseline to follow-up. Two-way repeated measures analyses of variance tested whether the effects of writing condition on depression and immune function at follow-up differed for women and men. There were no significant condition by time by gender interactions, indicating that the effects of writing on changes in depression and immune function did not significantly differ for women and men.

Exploratory analyses were conducted to examine the effects of writing on the number of positive and negative changes participants described as a result of dealing with HIV. Because there was no baseline assessment of positive and negative changes, separate analyses of variance, rather than repeated measures analyses of variance, were used to test the effects of writing condition on these measures and the extent to which these effects were different for women and men. These analyses included only participants who completed at least three of the four writing exercises. There were no significant differences between conditions and no condition by gender interactions on the number of positive or negative changes described by participants at either the 2-month or 6-month follow-up interviews.

The results of both the repeated measures analyses for depression and B2-M, and the analyses of variance for positive and negative changes, remained the same when participants who failed to complete at least three writing exercises were also included in the analyses. Only three participants who returned to the 2-month follow-up failed to complete at least three writing assignments.

Within-Group Analyses of Expressive Writing

Regression analyses examined how the words participants used in the expressive writing intervention (as computed by the LIWC text analysis program) influenced its benefits (i.e., depression, immune function, and the number of positive and negative changes reported from dealing with HIV). The word categories examined as predictors were percentage of positive emotion words and changes in insight/causation words combined and social words. For those dependent measures that included a baseline assessment (depression, and B2-M), the baseline values was entered in the previous step of the regression. Only participants who did not have missing data for the outcomes investigated and who returned at least three of the four writing exercises were included in the analyses.

Analyses revealed that those who included increased causation and insight words from earlier to later writings had lower B2-M (which is related to better immune control and slower HIV progression) at the 2-month follow-up, controlling for baseline levels of B2-M, $b = -.54$, $t(30) = -3.75$, $p < .01$, and reported fewer negative changes at the 2-month follow-up, $b = -.40$, $t(29) = -2.31$, $p < .05$. They also reported more positive changes at the 2-month follow-up, although this difference did not reach conventional levels of significance, $b = .33$, $t(29) = 1.87$, $p = .073$. Those who included increased social words likewise had lower B2-M at the 2-month follow-up, $b = -.38$, $t(30) = -2.45$, $p < .05$, and described more positive changes at the 6-month follow-up, $b = .46$, $t(21) = 2.31$, $p < .05$. Levels of positive emotion words did not predict B2-M immune function, depression, or positive and negative changes. These patterns did not emerge in the control condition.

DISCUSSION

This study provides mixed support for the benefits of expressive writing for people living with HIV. Although there were no effects of expressive writing on depression, immune function, or the number of positive or negative changes described at the 2-month or 6-month follow-ups, the ways that participants wrote about their experiences influenced benefits from expressive writing. Expressive writing participants who showed increased cognitive processing and discussion of social themes in their writing had better immune function and described more positive changes at follow-up than those who did not. These results are consistent with previous studies indicating that increased cognitive processing in written essays or in verbal interviews predicts health benefits (Bower *et al.*, 1998; O'Cleirigh *et al.*, 2003; Pennebaker *et al.*, 1997; Ullrich and Lutgendorf, 2002). The results in the current study suggest that cognitive processing is critical to the benefits of expressive writing. The cognitive processing that takes place during writing may improve adjustment by facilitating changes in how individuals think about the events and helps individuals find meaning in the stressful experiences (Donnelly and Murray, 1991;

Park and Blumberg, 2002; Pennebaker, 1993; Ullrich and Lutgendorf, 2002). The current study also suggests that increases in expression of social themes may be important in the benefits of writing. However, the nature of the social themes expressed in the writing, and the extent to which they reflect social support, conflict, or burdens could not be captured by the LIWC program. It is possible that those, for whom writing prompted changes in social interactions, may have experienced greater health benefits and positive changes from the writing. This is consistent with Pennebaker's findings (Pennebaker, 2004; Pennebaker and Graybeal, 2001) that writing influences how people talk with others and affects their relationships. More research is needed to investigate how changes in social interactions may mediate the impact of writing.

Although there were some gender differences in the writing samples, with women including more social words, women and men seemed to respond similarly to the writing intervention. There were no gender differences in the effectiveness of writing. However, this finding should be interpreted with caution given the small sample size and limited power to detect the moderating effect of gender. Little research has compared the efficacy of writing for women and men, although in Smyth's (1998) meta-analysis, studies that included a greater proportion of men found a larger effect of writing, and men in Klein and Boal's (2001) writing intervention tended to experience greater memory benefits from writing than women. Effects of writing have been found both in female samples (Stanton *et al.*, 2002) as well as samples of men (Rosenberg *et al.*, 2002). Additional research comparing the effectiveness of writing for women and men is needed to understand how different populations respond to this writing intervention.

This study also examined differences in the social lives of women and men living with HIV. Although there were factors that suggested greater vulnerability for women living with HIV compared with men (i.e., lower SES), results also indicated the presence of protective factors (i.e., greater comfort with discussion of HIV). There were no differences between women and men in depression, immune function, AIDS diagnosis, or social support, but women reported feeling more comfortable talking to people in their lives about their HIV than men did. Women also included more social references in their writing, particularly references to family. Others, particularly family members, may be more prominent in the daily lives of women dealing with HIV, and women may feel more comfortable talking to them. The stigma associated with homosexuality may make it more difficult for men to discuss their HIV with their support network. Both the HIV positive women and men in this study reported many positive changes in their lives, including positive changes in relationships, health behavior changes, appreciation of life, personal strength, self-awareness, compassion, and spirituality. This is consistent with previous research (Folkman *et al.*, 1997; Siegel and Schrimshaw, 2000; Updegraff *et al.*, 2002) suggesting that, even in the context of the stresses and losses associated with HIV, women and men were able to find meaning and use their illness as a catalyst for personal growth.

Certain characteristics of the current sample may have reduced the power of the expressive writing intervention. Notably, most participants in the current study had a solid support system, either among their family and friends or in the HIV-positive community they were connected to, and had others they could talk to about their HIV. Their high level of support may have buffered their emotional distress (Kalichman *et al.*, 2003), as well as given them additional opportunities for expressing and processing their feelings about living with HIV. Expressive writing may be especially important for those who have fewer opportunities to talk about their experiences or who are ambivalent about discussing them (Norman *et al.*, 2004; Paez *et al.*, 1999; Rivkin, 2000), and may help reduce the negative impact of stigma on coping and emotional adjustment (Heckman *et al.*, 2004; Lee *et al.*, 2002). This project did not allow any budgeting for recruitment strategies which may have reached a more isolated and stigmatized population than those who were connected to community based organizations. In addition, the sample included only people who were willing to participate in a study involving interviews on experiences living with HIV. They represent a limited population of people living with HIV. Additional research is needed to examine whether these results would generalize to other HIV-positive populations that are more isolated and harder to reach. Additional research is needed including participants with more diverse experiences of social support and opportunities for discussing HIV, in order to examine how these individual differences may moderate the impact of expressive writing. This research can investigate whether expressive writing may be particularly effective for ethnocultural groups for whom expression of verbal emotion is not preferred and writing in private

a more comfortable and acceptable mode of expression consistent with cultural values.

Many of the participants were dealing with HIV for years or even decades (8.6 years was the average). Expressive writing may be more effective in the early years after infection. In addition, many of the positive changes participants reported, such as changes in priorities, had occurred during the initial years after HIV diagnosis, leaving less room for expressive writing to have an effect. Many of our participants were long-term survivors, who may already have a high capacity for depth processing (O'Cleirigh *et al.*, 2003). Expressive writing may have been less impactful for them because they had already found opportunities to cognitively process their experiences. In addition, the power of the analyses were limited by small sample sizes.

Participants who returned to the 2-month follow-up had higher education and greater word count in their initial writing sample than those who did not. Those who were more comfortable writing may have been more interested in continuing in the study. Future research should investigate how this writing intervention can be effectively implemented in populations differing in education and literacy levels. For example, talking into a tape recorder, which produces many of the same benefits as expressive writing (Esterling *et al.*, 1994), can be used for individuals with lower levels of literacy who may find it difficult to write.

The control writing was reported by participants to be just as personal and emotional and nearly as valuable as the expressive writing exercise, which contrasts with the findings of previous expressive writing studies (Petrie *et al.*, 2004). Both the experimental and control participants' ratings of the extent to which what they wrote was personal and emotional were similar to those of expressive writing participants in other writing studies (Klein and Boals, 2001; Pennebaker *et al.*, 1988; Petrie *et al.*, 2004).

The stories participants in the experimental condition wrote were powerful and personal. Some participants wrote about the initial shock and trauma of diagnosis itself, as illustrated in this example, "I took it hard. . .no one beats AIDS. I was devastated and it felt like a death sentence. I have known enough people, many younger some older, who already died from AIDS." However, much of the time, the writing dealt with ongoing HIV-related issues, including stigma, betrayal or feeling damaged. For example, "I feel un-whole as a person—damaged goods who cannot get things (and people) as easily as I used to."

The participants also wrote about their sense of loss. For example:

> Sometimes it's only me against me and I'm losing. The constant thought that no matter what I can do, I cannot do enough to make myself cured. For me, living is only enough to survive. I survive rather than live to the fullest, because even when my courage is at its highest level my heart is broken in half to know that my medications can only at their best control my illness but never to cure it.

Many participants wrote about the uncertainties of HIV and fears of planning for the future, as shown in this excerpt:

> I hate having AIDS, as it limits my future and present possibilities. . . There is a dark cloud above me that is waiting to explode, and has. Just as things seem to settle "normally", something occurs physically that undermines me. . .I cannot plan ahead for any length of time because I do not know how my health will be. . .knowing the frailty and uncertainties of living keeps me from long-term plans. . . I live in fear every day, fear of dying and fear of truly living.

Participants wrote about both positive and negative aspects of dealing with HIV, or as one participant put it, "This virus is a blessing and a curse". Many participants wrote about their experiences finding strength over the years in "living, not dying with HIV". For example:

> I never thought five years ago, when I was dying, [that] Valentines Day 2001, would be a joyous day for me. It was the hope and support from people around me that made that thing possible. It was also my inner strength and will to survive that made me well and alive. I never gave up hope. With determination and courage, I have overcome the barriers faced by those living with the disease: being in denial, having feelings of isolation, and having thoughts of committing suicide.

Often, the writing sounded like this strength and understanding was something that participants had come to long before the project began, although they continued to deal with ongoing HIV-related issues. Sometimes, however, the participants seemed to be struggling and searching in the writing itself, questioning their purpose and their legacy. For example, "Do I really live or just survive. . .and for what? Why am I still here and what is my purpose?"

The writings of the control participants can, in most cases, be easily distinguished from those of the expressive writing participants. Typically, the stories control participants wrote did not delve as deep as those of expressive writing participants, but

they were nevertheless often personal and emotional. The control participants did write about their daily activities. However, they often did not write in a dispassionate way, particularly in the writing they completed on their own at home. Many inserted their emotions and thoughts into the writing, reflecting on how something that happened that day made them feel. For example:

> Yesterday was my baby's 1st birthday party and I'm still smiling. . . He's the joy of my life right now and I'm going to try with everything I have in me to be there for him. That's why his birthday was just as special for me as it was for him.

The participants were facing many ongoing challenges in their daily lives (such as adhering to complicated HIV medication regimens) that were revealed in their descriptions of their daily activities:

> I have to take the final set of medications for the day, which I reluctantly take. You know I hate taking these medications day in and day out. I feel my life is just consumed by taking medications. Especially, I hate to take at least 10 pills every time.

Although the control writing did not elicit as much emotional expression or cognitive processing as the expressive writing (as indicated by the greater number of emotion and cognition words in expressive writing exercises), people did use the exercise to discuss social aspects of their lives. Whereas many of the expressive writing participants explained that their writing helped them confront and express difficult emotions, increased their insight and self-awareness, and helped them face reality, many control writing participants explained that their writing was meditative, helped them reflect on their day, and helped them recognize that people cared about them. Thus, even control participants may have benefited from their writing, which may have contributed to the lack of differences between conditions.

In addition, participants in the current study expected to participate in a study on dealing with HIV, and the interview prior to the writing intervention including assessment of social support, HIV disclosure, and the extent to which they talked about HIV-related issues to the people in their lives. They may have thus included more discussion of HIV or support related issues in their writing about their daily activities than participants in other studies with a daily activity writing control group. Finally, taking part in a writing intervention may have motivated some participants to start writing on their own. For example, one control participant said:

> It kick-started me into entering some more things into my journal again, just jot some feelings. But you didn't really ask for thoughts and feelings in the writing exercises. But it had that side benefit but I didn't write similar passages in my journal as I did for you.

Neither group had significant changes in immune function or depression from baseline to follow-up. However, it is unclear whether, without intervention, participants may have experienced decrements in immune function or depression. In other expressive writing studies, control participants had decrements in self-reported emotional and physical health from baseline to follow-up (cf. Park and Blumberg, 2002). The possibility remains that both writing conditions in the current study experienced benefits, which cannot be detected without an additional no-writing or trivial-writing control group.

The effects of writing may have been diluted by the fact that the writing was unsupervised and completed at home. Although there was a high degree of compliance to the intervention, with most participants completing at least three of the four writing exercises, participants may have been less likely to adhere to the specific instructions of their writing exercise than if it had been completed in a setting in which writing was supervised. For example, control writing participants may have been less likely to list activities dispassionately and more likely to incorporate their thoughts and feelings in their writing. This may have contributed to the lack of differences between conditions in some of the manipulation check variables and diluted the effects of the intervention. Most writing studies include supervised writing sessions in the lab, although a few studies finding effects of expressive writing included at-home writing (Ullrich and Lutgendorf, 2002; Rosenberg *et al.*, 2002; Hockemeyer and Smyth, 2002). Future studies should investigate differences in effects of writing completed in the lab versus at home, and how to maximize the benefits of unsupervised writing so that writing interventions can generalize outside the lab.

The words people use in their writing may reflect their psychological state and individual differences in how they process stressful experiences. Thus, an alternative explanation for the within-group findings is that those individual differences, rather than the qualities of the writing per se, may influence health and adjustment. However, the analyses examining linguistic predictors of emotional and physical adjustment controlled for initial levels of adjustment. This suggests that the findings were not just capturing

stable effects of personality, but rather that the words people used in their writing were playing a role in the benefits they experienced.

Eligibility on the basis of HIV-positive status was based on self-report, and it is possible that some reports were inaccurate. However, most inaccuracy in self-reported HIV status arises from HIV-positive persons who report being negative (Latkin and Vlahov, 1998; Lindan *et al.*, 1994). Because eligibility was based on several factors, not just HIV status, and because we emphasized the importance of confidentiality and candor in the screening process, we believe that few if any participants were misreporting their HIV status. The project did not allow budgeting for collection of biospecimens by which to confirm self-reported HIV status. Many of the dependent measures used in this study, including depression and positive and negative changes from living with HIV, were also self-reported. Often the effects of writing on self-reported psychological adjustment have been less consistent than its effects on objectively measured immune or health outcomes (Pennebaker *et al.*, 1997). The current study did include a measure of immune function, B2-M, which is related to HIV progression (Fahey *et al.*, 1990). However, B2-M may not be as sensitive a measure of immune function and HIV progression as T-cell count and viral load. T-cell count and viral load may thus be more responsive to the immunological effects of expressive writing (cf. Petrie *et al.*, 2004). Future research on expressive writing for persons living with HIV should study specific immunological characteristics to determine the pathways between emotional expression and HIV-specific immune function. In addition, future studies examining effects of writing on immune function for HIV-positive participants should control for medication adherence (not assessed in the current study).

In summary, the results of this study, as well as previous literature, suggest that cognitive processing of emotions and concerns about HIV can facilitate better emotional and physical adjustment. An intervention such as expressive writing that can help people confront and process their disease has the potential to improve the lives of people living with HIV. This expressive writing intervention has been found to improve health and well-being for people dealing with a variety of stressful and traumatic experiences (Pennebaker *et al.*, 1988; Smyth, 1998), including those coping with chronic illnesses (Smyth *et al.*, 1999). For people living with HIV, this writing intervention may be more effective when it is incorporated into a more intensive counseling approach that facilitates greater cognitive processing and emotion-regulation.

Writing interventions have been incorporated into psychotherapy with positive results, such as greater change in behaviors, cognitions, and self-mastery (Jordan and L'Abate, 1995). In the therapeutic environment, there is also opportunity for therapist feedback and guidance on writing sessions, which can increase cognitive processing and enhance benefits. For example, a guided written disclosure intervention (in which participants were instructed to describe a traumatic event chronologically, reflect on their thoughts and feelings at the time of the event and how it affected their life, and then to describe their current perspective on it) resulted in reduced symptoms and fewer clinic visits, compared to control writing, in a sample of frequent clinic attenders (Gidron *et al.*, 2002). Guided instruction in written or verbal disclosure can help facilitate shifts in how people process a traumatic experience such as HIV or AIDS diagnosis, which can have an impact on changes in their lives, their emotional adjustment, and their health.

Future research can investigate how writing or counseling interventions can best facilitate cognitive processing, break through denial, and increase cognitive, emotional, and physical adjustment to HIV. In addition to examining the factors that influence the benefits of expressive writing, this study provides valuable information on the concerns and struggles faced by women and men coping with HIV, and their resilience. Additional research is needed to examine how women and men respond to different writing interventions, and which writing interventions may be most effective for different populations.

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