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Written Emotional Disclosure Buffers the Effects of Social Constraints on Distress Among Cancer Patients

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The aims of the present study were to examine whether written emotional disclosure would reduce distress among cancer patients and whether it would buffer the effects of high levels of social constraint (negative social responses to patients' expressions of emotion regarding their cancer) on distress. Cancer patients ($N = 104$) were randomly assigned to write about their emotions regarding their cancer 20 min a day for 3 days or to write about a nonemotional topic. They completed questionnaires at baseline and 6 months postintervention. Results showed that written disclosure buffered the effects of social constraints on stress at the 6-month follow-up and that avoidance partly mediated these effects. The present data reinforce the notion that interventions should be tailored to patients' needs.

Key words: emotional expression, cancer, stress, cognitive processing, intervention, expressive writing

A number of interventions have been shown to be effective among individuals dealing with the stress of chronic illnesses such as cancer. More recently, however, it has been suggested that not all patients may draw equal benefits from all intervention techniques (e.g., Helgeson, Cohen, Schulz, & Yasko, 2000), underscoring the importance of examining individual differences in an effort to move toward more individualized treatment approaches. Emotional expression is an integral part of many such interventions, and written emotional disclosure, a technique developed by J. Pennebaker, has been shown to effect improvements in psychological and physical symptoms among individuals dealing with a variety of stressful or traumatic life events, including medical illness (e.g., Pennebaker, 1997; Pennebaker, Colder, & Sharp, 1990; Smyth, Stone, Hurewitz, & Kaell, 1999). It could be argued that written emotional disclosure would be most beneficial to those individuals who have little in the way of emotional outlets in their social environment.

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In the present study, we examined whether cancer patients would benefit from written emotional disclosure and whether written disclosure would buffer the adverse effects of social constraints (i.e., perceived unhelpful and avoidant responses from people in the patient's social network in response to the patient's attempts at emotional expression) on distress. Furthermore, we examined whether cancer-related intrusive thoughts and avoidance would mediate this relationship.

Emotional Expression

Expression of emotions, particularly in the context of stressful or traumatic life experiences such as cancer, has long been found to be associated with psychological and somatic benefits (e.g., Gross, 1989; Stanton et al., 2000; Van der Ploeg et al., 1989; Watson et al., 1991; Zakowski, Valdimarsdottir, & Bovbjerg, 2001). When confronted with a traumatic event, such as the diagnosis and treatment of cancer, most individuals want to talk about their experience, suggesting a pervasive need for emotional support that allows emotional expression (Rime, 1995). Indeed, one of the main functions of social support is to provide an individual with the opportunity to discuss his or her feelings. Among cancer patients, emotional support has been associated with lowered distress, fewer mood disturbances, and enhanced physical recovery (e.g., Bloom, 1986; Roberts, Cox, Shannon, & Wells, 1994).

Social Constraints and the Role of Written Emotional Disclosure

Unfortunately, not all social interactions are supportive of discussing distressing experiences. Studies have shown that cancer

patients' social environments are not always helpful in encouraging them to express their emotions, and patients may encounter social barriers (Manne, Pape, Taylor, & Dougherty, 1999) at a time when emotional support may be most needed (Northouse, 1988). Negative social interactions can take on many forms in times of crisis, including criticism of the person's behavior, avoiding the person, showing discomfort, and minimizing the person's problems (Dakof & Taylor, 1990; Dunkel-Schetter, 1984; Manne, 1998; Manne, Alfieri, Taylor, & Dougherty, 1999). One type of unsupportive social behavior that is particularly relevant to individuals dealing with the stress of having cancer concerns restraints imposed on their efforts at expressing their emotions. Social constraints (Lepore & Ituarte, 1999; Lepore, Silver, Wortman, & Wayment, 1996) can be defined as perceived inadequacy of social support resulting in a reluctance to express thoughts and feelings about a specific stressor (e.g., people may respond by minimizing the experience, acting uncomfortable when emotions are expressed, or simply avoiding the person who is attempting to talk about the experience).

Although many cancer patients report being satisfied with their support networks (Dakof & Taylor, 1990), the potential detrimental effects of social constraints should not be underestimated and have been demonstrated with individuals facing a variety of stressful events (Lepore & Helgeson, 1998; Lepore et al., 1996; Ramati & Zakowski, 2001; Zakowski et al., 2004). Social constraints may discourage people from speaking about stressful experiences, which in turn may keep them from confronting and processing such events, resulting in delayed or incomplete psychological adaptation. If this is the case, alternative forms of emotional expression may be able to compensate for lack of expressive opportunities in social settings and thus act as a buffer against the adverse consequences of social constraints. Of particular interest is emotional disclosure through writing, a method established by Pennebaker (1997) that has been used by many other researchers to allow individuals to process stressful or traumatic experiences.

Engaging in written emotional disclosure for 20–30 min a day for 3 or 4 days has been found to result in improvements in health (usually assessed by a reduction in physician visits), decreased distress and somatic complaints, increased immune function, and increased academic performance in college students (see Smyth, 1998). To date, the few studies that have been conducted among patient populations have yielded mixed results. Positive physical health outcomes have been reported in asthma, arthritis, and breast cancer patients (e.g., Smyth, Anderson, Hockemeyer, & Stone, 2002; Smyth et al., 1999; Stanton & Danoff-Burg, 2002). However, studies examining the effects of written disclosure on psychological distress have revealed either no significant effects (e.g., Walker, Nail, & Croyle, 1999) or reductions that were evident only in a subgroup of patients (e.g., Stanton & Danoff-Burg, 2002), suggesting the importance of moderating variables.

The present study provided a test of the effects of written emotional disclosure on distress in another patient population, gynecological and prostate cancer patients. On the basis of previous findings, we further hypothesized a moderating effect such that written disclosure would be most likely to reduce distress in the case of those patients who perceived the constraints on emotional expression posed by their social environment to be high. In addition, we explored mechanisms for the effects of disclosure based on cognitive processing theories. According to these theories, stressful events may provide information that is discrepant with people's assumptions about themselves and their world, which will cause negative thoughts and emotions to arise (Foa & Kozak, 1986; Foa, Steketee, & Rothbaum, 1989; Janoff-Bulman, 1989). This negative affect may be so distressing that it is met with cognitive efforts at avoiding painful thoughts and stimuli surrounding the stressor, which may prevent effective resolution of the stressful experience and result in chronic stress (Horowitz, 1982, 1986).

Expressing thoughts and feelings about the stressor may provide a means by which people confront the experience and integrate it into existing schemas. This may reduce the distress associated with the cognitions regarding the experience (Lepore et al., 1996; Zakowski et al., 2001), rendering their avoidance unnecessary. Indeed, emotional disclosure has been found to result in reduced avoidance, which in turn predicts positive outcomes (e.g., increased immune function; Lutgendorf, Antoni, Kumar, & Schneiderman, 1994). It has also been associated with reductions in intrusive thoughts in some (e.g., Klein & Boals, 2001; see also Lepore & Smyth, 2002) but not all (e.g., Lepore, 1997; Smyth, True, & Souto, 2001) studies. We argue that lack of emotional expression in a social context may lead to continued avoidance of cancer-related thoughts and stimuli, which in turn prevents psychological adjustment unless the individual is given the opportunity to discuss his or her emotions in an alternative context, that is, writing.

The present study addressed several hypotheses. First, expressive writing will result in reduced distress among gynecological and prostate cancer patients. Second, this effect will be qualified by an interaction effect in which patients who report high levels of social constraint will be most likely to benefit from expressing their emotions in writing. Third, a reduction in cognitive avoidance and possibly in intrusive thoughts will partly account for reductions in distress among those patients who report high levels of social constraint. We included prostate cancer and gynecological cancer patients because we surmised that they would be particularly likely to experience difficulties talking about their cancer in a social setting owing to the personal nature of some of the problems associated with these diseases (e.g., sexual problems). In fact, research has shown that these patients experience social constraints associated with distress (e.g., Lepore & Helgeson, 1998; Zakowski et al., 2004).

Method

Participants

Patients who had been diagnosed with prostate or gynecological cancer within the past 5 years were recruited through clinics in the Chicago and Milwaukee metropolitan areas for a broader ongoing longitudinal study examining the psychosocial effects of emotional disclosure. Eligibility requirements included a first-time diagnosis of prostate or gynecological cancer, completion of active cancer treatment, no evidence of psychiatric problems or any current life-threatening disease other than cancer, and ability to fluently read and write in English. Of the patients who were initially screened for the study, 27% declined participation. The most frequently cited reasons were lack of interest or time (84%), being too ill (12%), and dealing with other problems (4%). Of the 127 patients who agreed to participate, 17 dropped out of the study after the baseline assessment (control group: $n = 8$; experimental group: $n = 9$), and 6 did

so after completing the writing (control group: $n = 3$; experimental group: $n = 3$).

The final sample of 104 patients who completed all of the assessments necessary for the present analyses had been recruited over the course of 2 years. Patients were between 25 and 84 years of age ($M = 59.75$, $SD = 11.09$); 51.9% were female, 95.2% were Caucasian, 79.8% were married, 51% were employed, and 46.2% had at least a college education. Types of cancer included prostate carcinoma (48.1%), uterine (18.3%), ovarian (13.5%), cervical (11.5), and other (4.9%); 3.8% of the patients had more than one type of cancer. Gleason scores, available for 40 of the prostate cancer patients, ranged from 3 to 8; the majority of these patients presented at Gleason Stage 6 (44%). Stages were available for 41 gynecological cancer patients; these patients ranged from Stage I to Stage IV, with the majority presenting at Stage I (43%). Time since cancer diagnosis ranged from 0.14 to 4.96 years ($M = 1.43$, $SD = 1.21$), and 85.6% of patients had undergone surgery to treat their cancer (see Table 1 for data on demographic and medical variables by experimental condition).

Measures

Demographic questionnaire. This face-valid questionnaire gathered basic demographic information, including age, ethnic group, education, and marital status.

Medical history questionnaire. Patients were asked to provide basic medical information with respect to their cancer, including date of diagnosis, tumor site, stage of disease at diagnosis, treatments received, and other concurrent chronic health problems. This information was verified through review of patients' medical charts.

Social Constraints Scale (SCS). The SCS (Lepore & Ituarte, 1999) is a 15-item scale assessing perceived inadequacy of social support resulting in reluctance among individuals to express thoughts and feelings about a specific stressor, in this case their cancer experience. Example items include "How often did they avoid you?" "How often did they minimize your problems?" "How often did they tell you to try not to think about your cancer?" and "How often did they make you feel as though you had to keep feelings about your cancer to yourself, because they made him/her feel uncomfortable?"

Two forms of the SCS were used in the present study, one asking about constraints from patients' spouse or partner and one asking about constraints from people in their lives other than their spouse or partner (e.g., friends or family members). Because the two scales were highly correlated ($r = .63$, $p < .001$) and we were interested in patients' average perceived levels of constraint, we used the mean of the two constraint scores in all analyses (among the 19 patients who had no current spouse or partner, the constraints from others score was used, in that we considered this score to be reflective of their average constraint level). Mean total social constraint scores were correlated .90 and .93 with social constraints from spouse/partner and family/friends, respectively. Previous research involving the SCS has shown internal consistency (alpha) coefficients of .88 to .92 (Lepore & Ituarte, 1999). Reliability coefficients in the present study ranged from .85 to .87 for the two forms. Participants were asked to rate each item on a 4-point scale regarding how they felt during the past week. Possible scores range from 15 (low constraints) to 60 (high constraints). This questionnaire has been used in previous research with cancer patients (Lepore & Ituarte, 1999; Zakowski et al., 2004).

Brief Symptoms Inventory (BSI). This 53-item scale (Derogatis & Melisaratos, 1983) assesses symptoms associated with distress on nine dimensions: somatization, obsessiveness–compulsiveness, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. The scale also includes a global index of distress, the General Severity Index (GSI). Individuals report the extent to which they experienced each of the symptoms "in the past week including today" by rating each symptom on a Likert-type scale ranging from 0 (*not at all*) to 4 (*extremely*). The GSI summary score was used in the present study because it has been used with a number of different populations, including cancer patients, and is highly correlated with the BSI subscales (rs = .68 to .93 in this study). Possible scores for the GSI range from 0 to 4. The test–retest reliability of the GSI is high, with a stability coefficient (r) of .90, and its validity is well established (Derogatis, 1993).

Impact of Events Scale (IES). The IES (Horowitz, Wilner, & Alvarez, 1979) assesses frequency of intrusive thoughts and avoidance "over the past week, including today." It was designed to be anchored to a specific context, in this case cancer. Frequencies on each item were endorsed as not at all (0), rarely (1), sometimes (3), or often (5). Possible scores on the avoidance thoughts subscale range from 0 to 40, and possible scores on the intrusive thoughts subscale range from 0 to 35. The test–retest reliability of the intrusion and avoidance subscales is acceptable (rs = .89 and .79, respectively; Horowitz et al., 1979). The IES has been used in previous studies examining cancer-specific distress (Schwartz, Lerman, Miller, Daly, & Masny, 1995; Zakowski et al., 1997).

Manipulation check: Questions about the essays. After each writing session, participants were asked specific questions regarding how personal they felt their essays were and the extent to which they felt they had revealed their emotions in the essays (Pennebaker, Kiecolt-Glaser, & Glaser, 1988). Each of these questions was rated on a 7-point scale.

Table 1
Demographic and Medical Data by Experimental Condition

Characteristic	Experimental group		Control group		
	M	%	*M*	%	*n*
Demographic					
Age (years)	58.3[a]		61.8[b]		104
College degree		45		49	104
Currently married		81		79	104
Employed outside the home		56		48	103
Caucasian		93		98	104
Female		47		59	104
Medical history					
Surgery		89		81	103
Time since diagnosis (years)	1.37[c]		1.52[d]		103
Other chronic illnesses		5		7	101

Note. All group comparisons were nonsignificant.
[a] $SD = 11.9$. [b] $SD = 9.5$. [c] $SD = 1.27$. [d] $SD = 1.13$.

Procedure

Treating physicians referred eligible patients to the study. Those who indicated interest in participation were contacted by a member of the research group who explained the study and screened patients for eligibility. Written informed consent was obtained from all study participants. Because the patients in this study were recruited from different sites and resided in various cities many miles from our research office, we conducted all assessments and experimental procedures by mail and telephone (as described subsequently) so as to impose the least amount of burden on patients and to maximize compliance rates. All participants completed a baseline assessment that included questionnaires focusing on demographics and medical history, the SCS, the IES, and the BSI. Questionnaires were mailed to participants with detailed instructions and a self-addressed, stamped return envelope. An interviewer called participants to remind them to fill out the questionnaires and to address any questions. Participants were also sent a separate "writing packet" that included blank paper with their identification numbers to be used for the writing task, as well as a return envelope for the purpose of returning the essays by mail.

Participants were randomly assigned to one of two experimental conditions, the *emotional disclosure condition* ($n = 62$) or the *control condition*

($n = 42$). The unequal sample sizes in the two conditions were an artifact of the random assignment process, in that patient recruitment is ongoing. On completion of Assessment 1, participants were scheduled for 3 consecutive days on which they completed the writing task ("writing days"). In the rare event that a patient was unable to schedule 3 consecutive days, 3 days were scheduled as close to each other as possible and within the same 1-week period (10 participants completed the writing in 4 days, and 1 participant did so in 7 days).

Procedures for the writing manipulation were as follows. On Day 1, the interviewer called the participant at a designated time and provided a brief introduction to the writing task. Participants were asked to go to a quiet place in their house where they would have no interruptions but could still be close to the phone. Next, participants were given detailed standardized instructions (as described subsequently) based on previously published methods (e.g., Pennebaker et al., 1990). Then participants were told to start writing immediately after hanging up the phone and to write continuously for 20 min, at which time the interviewer would call them again.

At the end of the writing period, the interviewer called the participant and asked whether he or she had experienced any interruptions during the writing. If the interruption was longer than 5 min, the participant was asked to continue writing (to complete the 20-min writing period) until the experimenter called again. At this point, the participant was instructed to fold the writing sample and place it in the return envelope provided. A short debriefing followed in which the participant was simply asked whether he or she had any questions or concerns. Then the writing time for the following day was confirmed. The procedures for the second and third writing days were identical, with the exception that the initial brief introduction from Day 1 was omitted.

After the last writing day, participants sent their essays and questionnaires to the research office in a return envelope. Six months after completion of the writing assignment, a follow-up assessment was conducted; this assessment involved the same procedures as the baseline assessment and included the IES, BSI, and SCS (only the baseline SCS was used in the main analyses). On completion of the study, all participants were debriefed. For the purposes of maintaining rapport with the participants and maximizing compliance, the same experimenter conducted all assessments with each participant. Because experimenters also administered the writing instructions, they were aware of condition assignments; however, given that contact was minimal at the follow-up assessments (except for mailing of the questionnaires and placing of a reminder phone call), we consider the possibility of experimenter bias to be minimal.

Instructions

Participants in the emotional disclosure condition were told to write continuously for 20 min about their deepest thoughts and feelings regarding their cancer experience. Instructions were as follows.

> For the next three days, I want you to write about your experience with cancer. In your writing, I want you to really let go and explore your very deepest emotions and thoughts. It is critical that you delve deeply. Ideally, I would like you to write about those parts of the experience you found hard to share with others. Perhaps this will provide an opportunity to really examine those thoughts and emotions. Remember that you have three days to write. You can write about the same cancer experience for all three days or different experiences each day. You might tie your personal experiences to other parts of your life. How is it related to your family life, relationship with your spouse, your children, your sexuality, daily activities, hobbies, your past, your childhood, your work? These are just some examples.

Participants assigned to the control condition[1] were asked to describe in detail their daily activities in a nonemotional manner in accord with previously published procedures (e.g., Pennebaker et al., 1990).

> For the next three days, I want you to write about how you use your time. We are interested in everything you do during the course of a day. In your writing I want you to be completely objective. We are not interested in your emotions or opinions. Feel free to be as detailed as possible. In today's writing, I want you to describe what you did yesterday from the time you got up until the time you went to bed. You could include the things you ate, where you went, the tasks you had to complete, the people you saw. I want you to include details such as the time you got up, when you brushed your teeth, what toothpaste you used, what you ate for breakfast, etc. . . . The most important thing in your writing, however, is for you to describe your day as accurately and objectively as possible.

It was further emphasized in both conditions that the writing samples would remain completely confidential and would be identified only by the participant's identification number. Participants were instructed to not worry about style, grammar, or spelling, and they were told that no feedback would be provided to them regarding the contents of the essays.

All instructions were read from a standard script that was used for all participants. The principal investigator (Sandra G. Zakowski) trained all interviewers and conducted periodic treatment fidelity checks to ascertain whether administration procedures were consistent across interviewers and over time.

Results

Initially, we examined whether there were any significant differences in demographic or medical variables between conditions using analyses of variance or chi-square analyses as appropriate. No significant differences emerged between conditions on any of the variables, including age, gender, education, marital status, ethnicity, time since diagnosis, and disease stage (all ps $> .1$; see Table 1). Also, there were no significant baseline differences on any of the main study variables across conditions (see Table 2). Moreover, we found no significant relationships between major demographic and medical variables and the main dependent variables (all ps $> .1$). Therefore, none of the background variables were included as covariates in the analyses.

Manipulation Check

As compared with participants in the control condition, participants in the disclosure condition rated their essays as significantly more personal, as shown by a significant condition main effect, $F(1, 102) = 20.25$, $p < .001$, and a Condition × Writing Day interaction, $F(2, 204) = 3.58$, $p < .04$. Analyses (t tests) conducted for each writing day revealed significantly higher scores in the disclosure condition on all days, with the effects being strongest on

[1] Because there were no previously published reports on written emotional disclosure with medical patients when we began the study, we initially asked control participants to write for only 10 min per day. The concern was that cancer patients might not have sufficient daily activities to report for 20 min and thus might not comply with instructions. As the study progressed, however, and we learned more about the functional status of our patients, this became less of a concern and we chose to extend the writing time to 20 min for purposes of experimental methodology. We conducted a number of comparisons to ensure the comparability of controls who wrote for 10 versus 20 min on all major study variables. As expected, there were no significant differences on any of the variables, including GSI score, avoidance, negative and positive emotion words, and cognitive word change.

Table 2
Means and Standard Deviations of Study Variables by Experimental Condition

Variable	Experimental group (n = 62)		Control group (n = 42)		
	M	*SD*	*M*	*SD*	*p*
	Main study				
GSI baseline	0.42	0.44	0.33	0.29	*ns*
GSI follow-up	0.35	0.40	0.34	0.40	*ns*
Avoidance baseline	9.76	9.51	8.24	8.65	*ns*
Avoidance follow-up	7.23	8.27	6.55	8.57	*ns*
Intrusive thoughts baseline	7.31	7.92	6.21	7.52	*ns*
Intrusive thoughts follow-up	6.53	7.30	4.98	6.33	*ns*
Social constraints baseline	22.48	7.76	21.14	6.10	*ns*
Social constraints follow-up	20.51	7.66	19.71	6.41	*ns*
Manipulation check[a]					
How personal was the essay?					
Day 1	4.24	1.76	3.48	1.85	<.05
Day 2	4.74	1.41	3.24	1.68	<.05
Day 3	4.85	1.48	3.45	1.64	<.05
Expressed emotions in the essay					
Day 1	4.40	1.52	3.00	2.16	<.05
Day 2	4.76	1.24	3.05	2.07	<.05
Day 3	4.95	1.27	3.31	1.96	<.05

Note. GSI = General Severity Index.
[a] All differences were significant at $p < .05$.

Days 2 and 3. Similar results were found for the extent to which participants reported revealing their emotions in the essay, $F(1, 102) = 28.40$, $p < .001$, and there was a significant writing day main effect, $F(2, 204) = 5.23$, $p < .01$, suggesting an increase in emotionality across writing days. Thus, participant self-reports indicated that our emotional disclosure manipulation was successful (see Table 2).

Effects of Emotional Disclosure on Distress

To examine whether emotional disclosure affected distress and buffered the effects of social constraints on distress at follow-up, we conducted a multiple regression analysis in which baseline distress (GSI score) was entered in Step 1, social constraints and experimental condition were entered in Steps 2 and 3, and their cross product was entered in Step 4. There was a significant main effect for baseline GSI score, but main effects for experimental condition and social constraints were nonsignificant. As expected, there was a significant Social Constraints × Condition interaction (see Table 3). Regression lines plotted according to the criteria of Aiken and West (1991) revealed that participants in the control condition who reported high levels of social constraint exhibited the highest levels of distress at follow-up, whereas participants in the experimental group exhibited relatively low levels comparable to those of patients with low levels of constraint, thus supporting the buffering hypothesis (see Figure 1). Simple slope analysis (Aiken & West, 1991) confirmed a significant positive regression of distress on social constraints in the control condition, $t(101) = 2.26$, $p < .03$, and a nonsignificant regression in the experimental condition ($p > .1$).

Because use of covariance of baseline levels in a multiple regression procedure is recommended (e.g., Keppel & Zedeck, 1986) and is in line with previous research reports in this area (e.g., Helgeson et al., 2000; Smyth et al., 1999), but such methods are not always easily interpretable, we conducted additional analyses using GSI change scores to examine directions of change. All of the results were of comparable significance. Regression lines re-

Table 3
Hierarchical Multiple Regression Results Predicting GSI and Avoidance Scores at Follow-Up (N = 104)

Predictor	GSI				Avoidance			
	Δr^2	β	F (*df*s)	*p*	Δr^2	β	F (*df*s)	*p*
Baseline	.601	.775	153.76 (1, 102)	<.001	.450	.670	83.36 (1, 102)	<.001
Social constraints	.004	.075	0.88 (1, 101)	>.1	.003	.072	0.64 (1, 101)	>.1
Condition	.004	−.063	0.98 (1, 100)	>.1	.000	−.018	0.06 (1, 100)	>.1
Social Constraints × Condition	.016	−.507	4.45 (1, 99)	<.04	.033	−.714	6.25 (1, 99)	<.02

Note. GSI = General Severity Index.

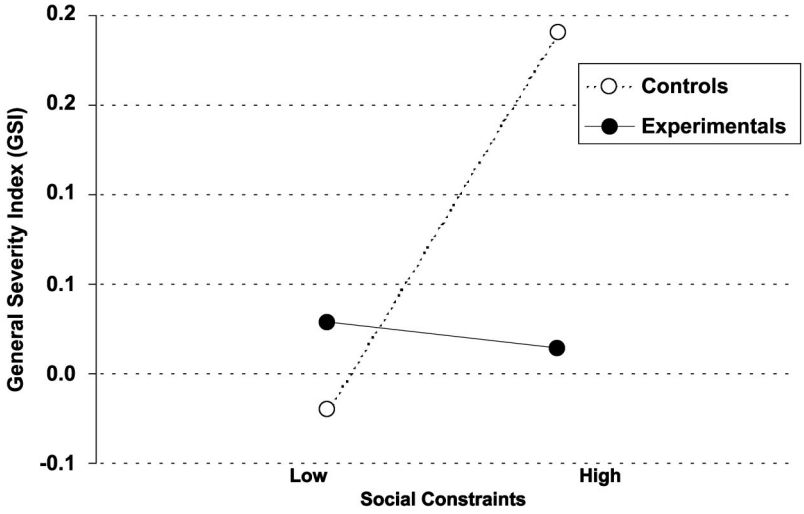

Figure 1. Interaction of baseline social constraints with experimental condition: effects on residualized General Severity Index scores at 6-month follow-up. Low and high social constraint scores reflect one standard deviation below and above the mean, respectively.

vealed a decrease in GSI scores at follow-up among experimental group participants who reported high levels of constraint and an increase in their control group counterparts. No marked changes were noted among patients who reported low levels of constraint, regardless of group assignment.

To examine the potential clinical significance of these findings, we dichotomized GSI scores based on standard *t*-score norms for female and male adult nonpatients using one standard deviation above the mean as a clinical cutoff (women: raw score above 0.62; men: raw score above 0.46; Derogatis, 1993). Logistic regression analyses regressing dichotomized GSI scores at follow-up on dichotomized GSI scores at baseline, experimental condition, social constraints, and the Condition × Social Constraints interaction revealed a significant positive relation of constraint with GSI score at follow-up ($B = .25$, $p < .05$) but no significant condition main effect or Condition × Social Constraints interaction.

Avoidance and Intrusive Thoughts at Follow-Up

Next, we examined whether the expressive writing task had differential effects on avoidance or intrusive thoughts depending on preexisting social constraints. Similar to the model just described, we regressed avoidance at follow-up on baseline avoidance, social constraints, and experimental condition, which were entered in the first three steps of the regression equation followed by the Social Constraints × Condition interaction. There was a significant positive relationship between baseline avoidance and avoidance at follow-up. The interaction effect was also significant (see Table 3).

Regression plots revealed that control participants who reported high levels of social constraint exhibited higher levels of avoidance regarding their cancer experience than control participants at low levels of social constraint as well as disclosure condition participants. The pattern of results was similar to that observed in the first regression (see Figure 1). This suggests that patients who perceived high social constraints in their environment and who were not given the opportunity to express their emotions in writing continued to cope by avoiding cancer-related thoughts and stimuli, whereas those who were assigned to the disclosure condition exhibited relatively lower levels of avoidance at follow-up. Simple slope analysis confirmed a significant positive regression of distress on social constraints in the control condition, $t(101) = 2.53$, $p < .02$, and a nonsignificant regression in the experimental condition ($p > .1$). Similar multiple regression analyses with intrusive thoughts as the dependent variable revealed significant main effects for baseline intrusive thoughts, $F(1, 102) = 43.50$, $p < .001$, and social constraints, $F(2, 102) = 9.00$, $p < .005$. There was no significant Social Constraints × Condition interaction.

Finally, we examined the possibility that avoidance may serve as a cognitive mechanism for the buffering effect of emotional disclosure on distress. Further regression analyses revealed that Time 2 avoidance was significantly associated with Time 2 distress after covarying for baseline. We further entered avoidance into the original regression equation predicting general distress to examine the possibility that this variable may account for the buffering effect observed. Entering avoidance at baseline and follow-up in the first and second steps of the regression equation rendered the Social Constraints × Condition interaction nonsignificant (see Table 4). This suggests that changes in avoidance partly accounted for the buffering effect of emotional disclosure on distress.

Discussion

The aims of the present study were to examine (a) the effects of written emotional disclosure among gynecological and prostate cancer patients, (b) written disclosure as a buffer of the effects of social constraints on distress, and (c) the potential mediating role of long-term cognitive changes (i.e., avoidance and intrusive thoughts). The first hypothesis regarding the effects of expressive writing on distress was not supported. The nonsignificant main effect of experimental condition on distress suggests that written

Table 4
Hierarchical Multiple Regression Results Predicting GSI Scores at Follow-Up, Controlling for Avoidance (N = 104)

Predictor	Δr^2	β	F (*df*s)	p
GSI baseline	.601	.775	153.76 (1, 102)	<.001
Avoidance baseline	.002	−.050	0.42 (1, 101)	>.1
Avoidance follow-up	.010	.451	38.44 (1, 100)	<.001
Social constraints	.005	.092	1.69 (1, 99)	>.1
Condition	.002	−.051	0.92 (1, 98)	>.1
Social Constraints × Condition	.004	−.254	1.34 (1, 97)	>.1

Note. GSI = General Severity Index.

emotional expression was not effective for all cancer patients in this study. These findings are comparable to those of recent studies conducted with breast cancer patients that reported no significant differences in self-reported distress at follow-up (Stanton & Danoff-Burg, 2002; Walker et al., 1999). It has, however, been suggested that the benefits of writing for cancer patients may reside in more objective measures of health rather than self-reported distress (Stanton & Danoff-Burg, 2002), given that many cancer patients are quite well adjusted emotionally.

Although the telephone administration did not appear to compromise the intervention in any way (all patients who participated in the writing task returned their essays to the research office, reflecting compliance with our instructions), it is possible that in-person contact was a beneficial element of the intervention the contribution of which has not previously been explored. In addition, asking patients to write about their cancer experience, a procedure used in both of the previous studies in this area conducted with cancer patients, may have been too constraining, and some of the patients might have benefited more from writing about other experiences that may have been more stressful to them. A study is currently under way in our laboratory examining the differential effects of writing specifically about cancer versus writing about one's most stressful experience.

The second hypothesis was supported by the results showing that written disclosure buffered the effects of social constraints on distress such that patients with high levels of constraint at study intake exhibited distress levels comparable to patients with low levels of constraint if they were given the opportunity to express their emotions in writing. Those at high constraint levels who were not given that opportunity (control condition) continued to exhibit heightened levels of distress at follow-up. These findings suggest that patients whose social environment precludes successful expression of emotion may be able to use other tools of emotional expression, specifically written emotional disclosure, to compensate for this deficit.

There is no doubt that when an individual engages in emotional expression in a social environment, a number of processes occur that cannot occur when she or he is merely engaged in the solitary activity of written emotional expression. There may be an exchange of experiences, a display of empathy or consolation, or other supportive behaviors such as advice giving (e.g., Clark, 1993). The fact that written emotional disclosure was able to reduce patients' distress to the level of patients who experienced lower levels of social constraint suggests that emotional expression per se may be a helpful tool that can take the place of positive emotional support. One possible explanation for the effect of written disclosure is that it simply provided patients with a stimulus to begin speaking more effectively about their emotions with others, resulting in lower levels of social constraint. Examination of the data, however, revealed no significant interaction between constraints (baseline) and condition ($p > .1$) at the 6-month follow-up, suggesting that the buffering effect on distress was not simply due to altered social communication.

The third hypothesis explored cognitive changes in patients' day-to-day life resulting from expressive writing as potential mediators of the effects observed. There was no significant effect on patients' intrusive thoughts about cancer, a finding that contributes to the mixed results in the literature regarding the effects of emotional disclosure on intrusive thoughts (e.g., Klein & Boals, 2001; Lepore, 1997). However, patients at high social constraint levels did exhibit continued cognitive avoidance of cancer-related thoughts and stimuli at the 6-month follow-up unless they were given the opportunity to express their emotions in writing. This avoidance in turn was positively associated with greater distress at follow-up, and regression results suggested that it may represent a mechanism in the buffering effect of disclosure on distress. This finding is consistent with previous research (Lutgendorf et al., 1994). Despite its initial protective effect, the long-term effects of continued avoidance may be detrimental and may prevent the individual from confronting and processing the threat (e.g., Horowitz, 1982, 1986). Emotional expression may allow patients to process their experience sufficiently so that they can relinquish this protective cognitive mechanism as the cancer-related information becomes less threatening. These findings need to be interpreted with caution in that more conclusive, mediated moderation analytic procedures (Baron & Kenny, 1986) were not applied here.

Although statistically significant, the clinical significance of the changes observed in the present study is unclear. Effect sizes were relatively small, and examination of patients' distress scores at baseline and follow-up using a cutoff score of one standard deviation above the mean of standard *t*-score norms revealed no significant Condition × Social Constraints interaction. This suggests that, despite the fact that expressive writing buffered the effects of social constraints on distress, it did not alter distress levels from clinical to nonclinical categories. However, these results are limited by the fact that only a small proportion of patients were within the clinical range at study initiation ($n = 22$). This does not minimize the importance of our findings. Given that many cancer patients exhibit subclinical levels of distress that may have a significant impact on other aspects of their lives, finding means of reducing their distress remains an important endeavor in health psychology.

As in many previously published emotional disclosure studies (most of which were conducted with college students), the participants in this study were relatively well educated (almost half had a college degree). However, we did note a range from partial high school education to graduate professional training, and our results revealed no significant relations between education and any of the major study variables, suggesting that our results may be generalizable to individuals at various educational levels. This, however, should be addressed more systematically in future research.

Some alternative explanations of the present findings need to be discussed. It could be argued that patients in the disclosure con-

dition began to seek additional opportunities for emotional expression, such as writing in a journal or participating in support groups, that in turn resulted in their reduced distress. Examination of self-report data revealed that only a small number of participants engaged in journal writing ($n = 8$) or participated in support groups ($n = 8$) or counseling ($n = 1$) at follow-up, which makes this explanation an unlikely candidate. There are, of course, alternative modes of expression that were not assessed in this study.

Finally, it is conceivable that a third variable accounted for the buffering effect of written disclosure. For example, a certain personality style or situational characteristic may be responsible for perceptions of social constraints and the benefits drawn from written disclosure. For example, patients who have a greater need for emotional expression or greater interpersonal sensitivity may consider any amount of emotional support insufficient and may thus perceive heightened social constraints. These same individuals may benefit more from writing because it allows a relatively unlimited amount of emotional expression within the time limit of the experimental procedure. The SCS is unable to address this issue because it focuses on patients' subjective perceptions. Although this was our measure of choice because of the theoretical importance of perceived over objective experiences of events (e.g., Lazarus & Folkman, 1984), future studies could examine this alternative explanation by supplementing self-report measures of social constraints with reports from supportive others as well as observational measures.

In summary, the findings from our study suggest that written disclosure may be a helpful tool in aiding patients in their psychological adjustment to their illness if they are lacking opportunities for expression in their social environment. Future studies should further examine the mechanisms of this effect and examine variables that may contribute to patients' perceptions of social constraints, including situational and personality variables. On a clinical level, this study provides additional evidence in support of the importance of matching interventions with patients' needs, suggesting that a well-matched intervention may compensate for deficits in emotional resources patients find in their social environment. The importance of beginning to refine our notion of what is helpful for patients toward a more individually tailored approach based on needs and deficits cannot be overstated and will result in more effective allocation of psychosocial resources.

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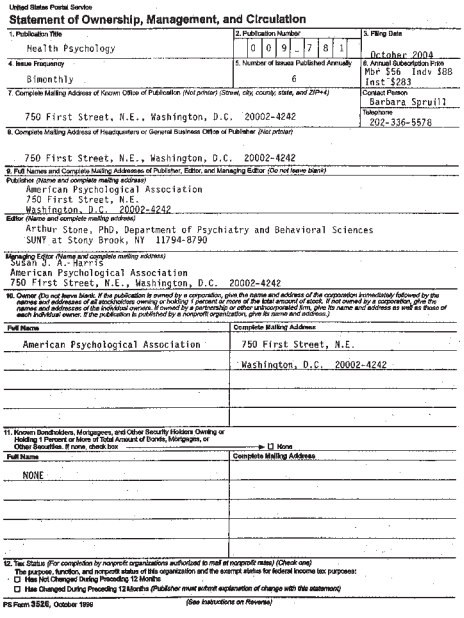

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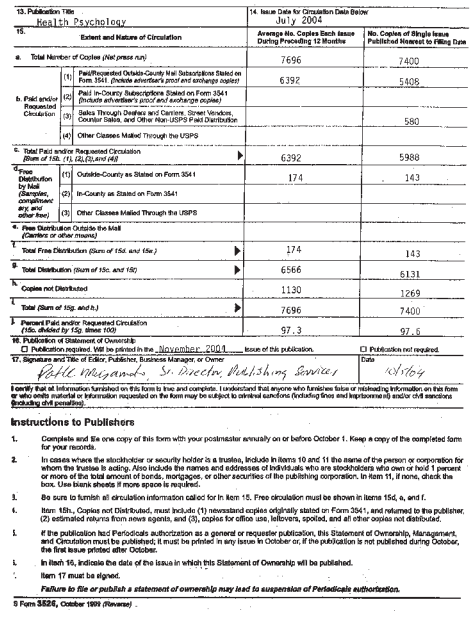

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