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to Prostate Cancer: A Brief Intervention for Patients
and Their Partners

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13. ABSTRACT (Maximum 200 Words) The current study examines the effects of a psychological intervention that encourages emotional expression in prostate cancer patients and their partners. Prostate cancer patients (n=130) and their partners are randomly assigned to an intervention or a control group. Following Pennebaker's model, subjects in the intervention group are asked to write about their deepest thoughts and feelings regarding their cancer experience for 20 minutes each day for three consecutive days. The control group is asked to write about trivial non-emotional topics. Outcome variables including psychological distress, quality of life, and physical symptoms is assessed at baseline and over a period of nine months after the intervention (one week, three, six, and nine months). In accordance with our approved Statement of Work data collection is currently underway. To date 260 subjects have been enrolled and are at various stages of the data collection process. Data processing is continuing as planned, including data entry and verification, which has been completed for all subjects currently enrolled in the project. Preliminary data analyses are being conducted.				
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Introduction

The current study examines the effects of a psychological intervention that encourages emotional expression in prostate cancer patients and their partners. Prostate cancer patients (n=130) and their partners are recruited at Chicago area hospitals. Eligibility of patients includes ability to read and write in English, absence of evidence of metastatic disease, absence of any concurrent chronic condition or concurrent or prior history of psychiatric disorders, and having a spouse or partner. Patients are recruited between two months to five years after diagnosis, and after completion of active cancer treatment (e.g., surgery, radiation). They are also asked for permission to contact their spouse or partner for recruitment into the study. As it is our goal to recruit a partner for each patient to maximize effectiveness of the intervention, the only exclusion criteria for patients' partners will be inability to read and write in English or any psychiatric disorder that would preclude participation. Patients and their partners are randomly assigned to an intervention or a control group. Subjects in the intervention group are asked to write about their deepest thoughts and feelings regarding their cancer experience for 20 minutes each day for three consecutive days. The control group is asked to write about trivial non-emotional topics. **Intervention Group:** Subjects are told to write continuously for 20 minutes about their deepest thoughts and feelings about their cancer experience (spouses/partners will write about how they have been affected by the patient's illness), and about how it relates to other aspects of their lives, e.g., their family life, relationship with their spouse, sexuality, daily activities, work, social life, etc. The instructions are designed such that subjects will feel free to write about the aspects of their experience that are important to them. To encourage emotional expression, it is emphasized that their writing samples will be kept completely confidential and anonymous and will only be identified by the participant's number, not their name. The essays will later be processed by independent blind readers who have no knowledge of the participant's identity or group assignment. Finally, participants are told to not worry about style, grammar, or spelling and that no feedback will be provided to them regarding the contents of the essays. **Control Group:** Procedures follow standard protocols used in previous research. Subjects are asked to write for 20 minutes each day about a trivial non-emotional topic that is assigned to them (e.g., description of their routine daily activities). Subjects will be told to remain factual and not add any emotional content. All other procedures will be identical to the Intervention Group.

Outcome variables including psychological distress, quality of life, and physical symptoms are assessed at baseline and over a period of nine months after the intervention (one week, three, six, and nine months).

Specific Aim I: To examine the effectiveness of the emotional writing intervention for patients and their partners. **Specific Aim II:** To examine mechanisms for the effects of expressive writing. **Specific Aim III:** To begin to identify those individuals who will be most likely to benefit from this type of intervention.

Body

Task 1: Preparation for the study (month 1 to 2):

The research protocols have been developed including instructions for all aspects of the protocol and questionnaire packets for each assessment. Research assistants have been trained to administer all parts of the protocol including the intervention, all assessments, and debriefings.

Task 2: Data collection (month 1 to 34 + 1 year extension):

Currently a total of 260 subjects (168 patients, 92 spouses) have been recruited into the protocol and are at various stages of the data collection process.

Task 3: Data processing (month 6 to 34 + 1 year extension):

All data currently collected have been entered. Data verification is conducted periodically to ensure accuracy of data processing.

Task 4: Data analyses (month 34-36 + 1 year extension):

Preliminary data analyses have been conducted and results are being written up for conference presentations and publications.

Key Research Accomplishments

- A total of 260 participants are enrolled in the study.
- Additional referrals are being obtained on an ongoing basis and patients are being screened for eligibility.
- Data entry and verification is conducted on an ongoing basis.
- Weekly research meetings are conducted.
- Preliminary data analyses are being conducted for conference presentations and publications.

Personnel

Sandra Zakowski, Virginia Boquiren, Sara Dittoe, Michele Herzer, Brian Schmaus, Angela Fidler, and Noelle Pontarelli have received pay from the research effort.

Reportable Outcomes

The following results are based on analyses with parts of the study sample and/or a combination of the patient sample recruited for this study and gynecological cancer patients recruited as part of another study.

Results reported in annual report of February 2004:

1. Emotional expression is an important means of coping with stressful experiences such as cancer. Social barriers to expression may have adverse effects. Research has suggested that men are less likely to express their emotions and have different patterns of social support compared to women. We examined whether male cancer patients have a lower tendency to express emotions, are less likely to perceive social barriers to expression, and are differentially affected by social barriers from different support sources as compared to women. Questionnaires were administered to 41 gynecological cancer patients and 41 prostate cancer patients using baseline data from the intervention project. There was a trend towards greater emotional expressivity in women as compared to men but no significant gender differences in perceptions of social constraints from spouse/partner or others. Multiple regression analyses revealed that men experienced significantly greater distress in association with social constraints from their spouse/partner than did women. Men may be more vulnerable to social barriers to expression than previously assumed. Gender differences in emotional expressivity may be less important than the social context in which expression takes place. Zakowski, S.G., Schwab, C., Krueger, N., & Laubmeier, K., Garrett, S., Flanigan, R., & Johnson, P. (2003). Social barriers to emotional expression and their relations to distress in male and female cancer patients. British Journal of Health Psychology, 8, 271-286.

2. Individuals facing the stress of cancer often rely on their social networks to allow them to express their thoughts and emotions in an effort to cope with their illness. However, these efforts are sometimes met with negative responses that inhibit their emotional expression (i.e., social constraints) which in turn may lead to increased distress. We hypothesized that expressive writing would buffer the distress associated with such social barriers. Patients diagnosed with cancer (N=103) within the past five years were randomly assigned to an experimental group, who wrote about their deepest thoughts and emotions about their cancer experience for 20 minutes a day for three consecutive days, or a control group who wrote about non-emotional topics. Patients (49% male) were ages 25-84, 95% Caucasian, 81% married, and had been diagnosed with prostate or gynecological cancer. They completed the Brief Symptom Inventory (BSI, distress) at baseline and 3 months post-intervention (Time 2), and the Social Constraints Scale (SCS) at baseline. Multiple regression analysis regressing Time 2 distress on baseline distress, SCS, Group, and SCS x Group revealed a significant SCS x Group interaction ($p=.015$) indicating that expressive writing buffered the distress associated with social constraints. These findings suggest that cancer patients whose social network responds negatively to their efforts to express their emotions regarding their cancer may be most likely to benefit from a writing

intervention. Patients who encounter few such social barriers may have less of a need for additional emotional outlets. This underscores the importance of matching psychological interventions to patients' needs. These findings were presented at the American Psychological Society, Barcelona, Spain, March, 2002.

Zakowski, S.G., Ramati, A., Morton, C., Johnson, P. & Flanigan, R. (2004). Written emotional disclosure buffers the effects of social constraints on distress among cancer patients. Health Psychology, 23, 555-563.

3. Repressive coping marked by a dispositional tendency to suppress disclosure of negative emotions may have adverse effects including increased physiological responses to stressors and progression of disease in cancer patients. We examined whether repressors are less likely to benefit from an expressive writing intervention compared to non-repressors (classified according to Marlowe-Crowne Social Desirability Scale (MCSDS)/Taylor Manifest Anxiety Scale (TMAS)). Patients diagnosed with prostate or gynecological cancer (N=109) within the past five years were randomly assigned to an experimental group, who wrote about their deepest thoughts and emotions about cancer for 20 minutes a day for three days, or a control group who wrote about non-emotional topics. Patients (51% female) were between the ages of 25-84, 95% Caucasian, 81% married. They completed the Brief Symptom Inventory (BSI, distress) at baseline and 3 months post-intervention (Time 2), the TMAS, and the MCSDS. Multiple regression controlling for baseline distress revealed main effects for social desirability and trait anxiety predicting Time 2 distress ($p's < .01$). A TMAS x MCSDS x Group interaction ($p < .04$) revealed that repressive copers (high desirability/low anxiety) benefited the least from the intervention, whereas truly low anxious patients and patients high on anxiety and social desirability benefited the most. Repressed copers may prefer other means of coping with stress and thus not benefit from interventions that focus on emotional expression. Individual differences should be considered when implementing interventions.

These findings were presented at the annual meeting of the Society of Behavioral Medicine, Washington, D.C., March, 2002.

4. Another individual difference variable of interest is neuroticism. We examined whether individuals high on trait neuroticism, characterized by chronic display of negative affect, benefit from interventions that focus on emotional expression of negative events or whether these exacerbate their negative affect. We examined depressive symptoms (BSI, POMS) and intrusive thoughts about cancer (IES) in 106 male and female cancer patients before (Baseline) and six months (Follow-up) following the emotional expression intervention. Patients (age: M=60, 53% female, 78% married, time since diagnosis: M=1.5 years) were randomly assigned to an expression and a control condition. Multiple regression regressing Depression at 6-month Follow-up on Baseline Depression, Neuroticism (NEO-FFI), Group, and Neuroticism x Group revealed a significant interaction ($p's < .01$). Participants low on Neuroticism who were in the expression condition experienced decreased depression at follow-up compared to controls. However, those high on trait Neuroticism reported increased depression after the intervention. Interestingly, they also exhibited increased intrusive thoughts as indicated by a Neuroticism x Group interaction ($p = .035$). It has been theorized that emotional expression may exert its benefits by enhancing cognitive processing of stressful experiences resulting in long term

reductions in intrusive thoughts and concomitant decreases in negative affect. According to our data this was the case for individuals low on Neuroticism, however expression had the opposite effect on high neurotic individuals who responded with increased intrusive thoughts and depression. It is thus essential to take personality differences into account when administering emotional expression interventions to individuals dealing with major life stressors. These findings were presented at the annual meeting of the International Society of Behavioral Medicine, Helsinki, Finland, August, 2002.

5. Written emotional disclosure of traumas has been associated with improvements in an individual's psychological adjustment, such as reduced levels of intrusive thoughts. It has been hypothesized that a certain level of emotional awareness (LEA) is necessary in order to effectively engage in emotional disclosure and thus obtain these benefits. Emotional awareness (EA) is defined as the capacity to be consciously aware of emotion and to constructively use emotional information. Lane and Schwartz (1987) proposed that EA undergoes 5 levels of structural transformation along a cognitive-developmental pathway with higher levels reflecting an increasing degree of organization in emotional experience. Using a novel application of the LEA model (Lane, 1990) to score patients' essays on LEA, we examined whether patients exhibiting a higher level of emotional awareness in their writing reported fewer intrusive cancer-related thoughts post-writing, reflecting greater benefits of disclosure. Prostate cancer patients ($N = 17$) wrote for 20 minutes for 3 consecutive days about their emotions regarding their cancer experience. Intrusive thoughts were assessed at baseline and 6 months post-writing. Essays were scored and rated on LEA. Regression analyses controlling for baseline intrusive thoughts showed that high LEA was associated with lower intrusive thoughts ($r = -0.537$, $p = 0.043$) at follow-up. The findings suggest that a greater ability to recognize and express emotions (higher LEA) facilitates resolution of a stressful experience via written emotional disclosure, as evidenced by a reduction in intrusive thoughts. This preliminary investigation demonstrates the usefulness of a new application of the LEA model in the analysis of the emotional content of personal essays and suggests that patients with high EA are more likely to benefit from emotional disclosure.

These findings were presented at the annual meeting of the Society of Behavioral Medicine, Salt Lake City, Utah, March, 2003.

6. Life-threatening events challenge one's schema about personal vulnerability. Emotional expression is associated with adjustment to such events possibly by assimilating the information of vulnerability with existing cognitive schemas. Assimilation may occur by changing the meaning of the threat and reducing the individual's sense of vulnerability. We examined whether emotional disclosure about patients' cancer experience would result in reductions in perceptions of vulnerability (e.g., risk of recurrence). Gynecological ($n=69$) and prostate cancer ($n=69$) patients who had completed active cancer treatment, diagnosed within the past 5 years were randomly assigned to write about their emotions regarding their cancer experience or about their daily activities (controls). They completed a Perceived Risk Scale (PRS) and Impact of Events Scale at baseline, 3 and 6 months post-writing. Groups were comparable on demographic and medical characteristics. The PRS, developed for this study, consists of 2 subscales, perceived risk for poor cancer prognosis and worry about risk. Repeated measures ANCOVA revealed a

significant time main effect ($p < .05$) and a significant condition by time interaction ($p = .02$). Perceptions of risk increased over time but this was moderated by condition. Patients who wrote about their cancer showed less of an increase in risk perceptions than controls. Risk perceptions were significantly correlated with worry and intrusive thoughts about cancer (r 's = .38 to .48) suggesting that perceptions of risk play a significant role in psychological adjustment to cancer. Neither worry nor intrusive thoughts changed as a function of writing condition. Emotional disclosure buffered the increase in perceived risk that patients were experiencing over time. Patients' vulnerability may increase as they are no longer under constant medical supervision. Emotional disclosure may be an effective intervention to prevent this increase. These findings were presented at the international conference of (Non)expression of emotions and health in Tilburg, NL, October, 2003.

7. Emotional disclosure has been shown to be beneficial in individuals dealing with a variety of traumatic and stressful experiences. While little is known about gender differences in the effects of disclosure, it has generally been found that women are more likely to use emotional expression as a form of coping with stress than are men. It is therefore often assumed that men may be less likely to benefit from emotional disclosure. The present study investigated the effects of written emotional disclosure in male and female cancer patients. Using Pennebaker's writing paradigm, 80 gynecological cancer patients and 84 prostate cancer patients were randomly assigned to two conditions. In the disclosure condition participants wrote about their emotions regarding their cancer experience for 20 minutes a day for three consecutive days. Controls wrote about their daily activities. Moods (POMS) were assessed at baseline, three, and six months post-writing. A 2 (gender) by 2 (condition) repeated measures ANOVA revealed a significant gender by condition interaction ($p < .01$). Inspection of means showed that while women exhibited little change in response to the disclosure intervention, men reported reduced mood disturbance at six months post-intervention. Women may have other emotional outlets possibly in their social environment that mask the effects of writing. The results suggest the value of implementing interventions that provide male cancer patients with a means to express their emotions. These findings were presented at the annual meeting of the International Psycho-oncology Society, Copenhagen, Denmark, August, 2004

8. Past research has provided evidence that written emotional expression after experiencing a traumatic event results in decreased distress and improved mental health. However, some research involving Critical Incident Stress Debriefing (CISD) has suggested that if the emotional disclosure occurs immediately following the stressful event the effects to the individual are either not helpful or detrimental. To date, little research has examined the specific point in time, following trauma, at which written emotional expression is most beneficial. This study hypothesized that benefits of expressive writing depend on time of intervention relative to the onset of the stressful event (i.e., diagnosis of cancer). Participants included 39 Prostate and 38 Gynecologic cancer patients who were recruited post-treatment within five years of their cancer diagnosis. The mean age of participants was 58.9 years and 94.8% of participants were Caucasian. Participants were contacted to participate by both phone and mail. After completing a baseline mood questionnaire (Profile of Mood Scale, POMS), participants were asked to write about their cancer experience for twenty minutes a day for three consecutive days in the privacy

of their own homes. The POMS was again administered 3 and 6 months following the writing intervention. Days since diagnosis at time of intervention ranged from 61-1,837. Early (61-285 days), middle (286-544 days) and late (over 544 days) intervention groups were formed via tertile splits on days from diagnosis to commencement of the emotional writing intervention. No between-group baseline POMS differences were found ($p=.60$). A 3 (Time of Intervention: early, middle, late) x 3 (Assessment: baseline, 3-months, 6-months) mixed-model ANOVA revealed a significant Time of Intervention x Assessment effect ($p<.05$). Simple effects analyses revealed decreases in total mood disturbance (as measured by POMS) from baseline to 3-months ($p=.06$), 3- to 6-months ($p=.07$) and baseline to 6-months ($p=.04$) for the early intervention group. Significant effects were, however, not evident for middle or late intervention groups for any epoch. These results suggest that time of intervention does affect the level of benefit gained from emotional expression through writing. Specifically, there is evidence that an emotional writing task administered between 60 and 285 days after cancer diagnosis may be more beneficial than when administered after this time span. This finding offers new information regarding intervention for those working with trauma victims or clients who have experienced significant stressful events. It seems that treatments involving emotional disclosure which are implemented sometime between 2-10 months following the event may be helpful for these populations. However, additional research needs to examine the effects of writing tasks which take place immediately after a stressful event has occurred (i.e., from 0-60 days). These findings were presented at the annual meeting of the American Psychological Society, in Chicago, IL, May, 2004.

9. Written emotional disclosure of trauma has been associated with improvements in a person's psychological adjustment. Pennebaker developed a text analysis tool (LIWC) to determine if language use (e.g., cognitive word usage) may be related to these benefits. Another potential method of text analysis looks at level of emotional awareness (LEA). Emotional awareness is the capacity to be consciously aware of emotion and to constructively use emotional information. Lane and Schwartz (1987) proposed that EA undergoes 5 levels of increasing structural transformation and organization in emotional experience. Using a novel application of the LEA model, we examined whether patients exhibiting a higher LEA in their essays reported fewer intrusive cancer-related thoughts (INTR) post-writing. We also compared the 2 text analysis methods (LEA vs. LIWC) in predicting INTR post-writing. Gynecological ($n = 20$) and prostate cancer patients ($n = 20$) wrote for 20 minutes for 3 consecutive days about their emotions regarding their cancer experience. INTR was assessed at baseline, 1-week, 3-months and 6-months post-writing. Essays were scored and rated on LEA. LIWC analysis was conducted to assess the change in cognitive words between the 1st and 3rd day of writing. Regression analyses controlling for baseline INTR showed that LEA accounted for 4.74% ($p = 0.062$), 4.87% ($p = 0.083$), and 4.64% ($p = 0.022$) of the variance in INTR at the 3 follow-up points respectively. Cognitive words, as assessed by the LIWC, accounted for 4.68% ($p = 0.079$), 4.81% ($p = 0.108$), and 3.82% ($p = 0.833$) in INTR respectively. Results suggest that methods focusing more on essay content may be better predictors of writing benefits. A greater ability to recognize and express emotions (higher LEA) may aid in the adjustment to a trauma via written disclosure. This preliminary investigation demonstrates the usefulness of a new application of the LEA model in the analysis of emotional content of personal essays.

These findings were presented at the Third International Conference on the (Non) Expression of Emotions in Health and Disease in Tilburg, The Netherlands, October 2003.

New findings since February 2004 annual report:

1. Empirical data and theoretical propositions have recently underscored the importance of positive marital interactions and spousal social support in psychological adjustment to diagnosis and treatment of cancer. Conversely, negative marital interactions and deteriorated spousal support provision appear to be related to poor psychological adjustment. In this study, we examined the predictive effects of patient personality and gender on one form of negative marital interactions that is both theoretically and empirically linked to particularly poor psychological adjustment: *spousal social constraints*. Spousal social constraints are barriers imposed on the expression of cancer-related emotions by a patient's spouse. Based on existing data on the pernicious effects of repeated distress expressions on the part of the patient on the quantity and quality of support provision, we suggested that patients who tend to frequently experience significant levels of negative emotion (e.g., high neuroticism) *and* express their emotion (i.e., high emotional expressivity) would show the greatest increases in spousal social constraints over time. Owing to gender differences in support seeking and provision, emotional expression, and levels of negative emotionality, we also examined whether patient gender further moderated the hypothesized effects. Results revealed a significant Neuroticism X Emotional Expressivity X Gender effect, such that *only* female patients who reported a tendency to frequently experience negative emotion *and* to express emotion fostered the greatest increases in spousal social constraints. Directions for future research were highlighted; for instance, observational measurement (versus self-report) of dyadic interactions among patients and their spouses is sorely needed. Potential clinical implications were also discussed; for example, interventions aimed at changing emotion expressive tendencies among female cancer patients, or, conversely, increasing capacity of male spouses' ability to respond empathically and with greater positive regard to their spouses' (i.e., patient) distress expressions.

Quartana, P.J., Schmaus, B.J., & Zakowski, S.G. (in press). Gender, neuroticism and emotional expressivity: Effects on spousal constraints among individuals with cancer. Journal of Consulting and Clinical Psychology.

2. Social barriers to expression (i.e. social constraints) from one's social support network appear to inhibit cognitive processing following diagnosis and treatment of cancer. Cross-sectional research has reported differential effects of constraints on intrusions and distress from men and women with cancer, such that constraints from spouses have been shown to affect men more than women, while women may more often seek support outside their marriages. The present study sought to support these findings prospectively, and to more specifically examine amount of talking about cancer with spouse versus others. Prostate (n = 98) and Gynecologic (n = 138) cancer patients completed questionnaires on social constraints from spouses and others, amount of talking about cancer with spouses and others, intrusions, and distress at two time points. *T*-tests and hierarchical regression analyses were used to test hypotheses. A significant Constraints-Spouse effect emerged [*Beta* = 1.02, *p* < .01], such that higher constraints were associated with greater distress. More importantly, a significant Constraints-Spouse x Gender

effect was found [$Beta = -1.12, p < .01$] such that, for men, constraints predicted 14.2% of the variance in distress, whereas for women, it predicted for only 2.6% of variance. A nonsignificant trend for Constraints-Others x Gender emerged for intrusions [$Beta = -.37, p = .08$] such that constraints were more strongly related to intrusions for women than men. Lastly, women reported talking about their cancer with others more than men ($p < .01$), whereas no gender differences were found for talking with spouses ($p = .25$).

These findings were presented at the annual meeting of the Society of Behavioral Medicine, in Baltimore, MD, May, 2004.

Conclusions

Several interesting results have been reported to date: In comparison to female cancer patients, prostate cancer patients report greater distress in association with social constraints; expressive writing buffers the negative effects of social constraints: repressive copers and neurotics benefit less from expressive writing; the use of higher levels of emotional awareness in expressive writing is associated with greater reduction in intrusive thoughts about cancer. In addition, we have found that expressive writing is associated with reduced perceptions of the threat posed by cancer; the effects of expressive writing on distress depend on the time of the intervention relative to the cancer diagnosis; and men show greater reductions in distress than do women. We will continue to conduct analyses to address the other study aims as more data are collected.

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Social barriers to emotional expression and their relations to distress in male and female cancer patients

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Objective. Emotional expression is an important means of coping with stressful experiences such as cancer. Social barriers to expression may have adverse effects. Research has suggested that men are less likely to express their emotions and have different patterns of social support compared to women. We examined whether male cancer patients have a lower tendency to express emotions, are less likely to perceive social barriers to expression, and are differentially affected by social barriers from different support sources as compared to women.

Design. Questionnaires were administered to 41 women and 41 men using a cross-sectional study design.

Method. Patients diagnosed with gynaecological or prostate cancer within the past 5 years completed questionnaires on moods, intrusive thoughts, social constraints and emotional expressivity.

Results. There was a trend towards greater emotional expressivity in women as compared to men, but no significant gender differences in perceptions of social constraints from spouse/partner or others. Multiple regression analyses revealed that men experienced significantly greater distress in association with social constraints from their spouse/partner than did women.

Conclusion. Men may be more vulnerable to social barriers to expression than previously assumed. Gender differences in emotional expressivity may be less important than the social context in which expression takes place.

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The expression of emotions holds an important place in psychology and has long been thought to be associated with psychological and somatic benefits. When confronted with a traumatic event, such as the diagnosis and treatment of cancer, the majority of individuals want to talk about their experience, suggesting a pervasive need for emotional support that allows emotional expression (Rimé, 1995). However, such support may be unavailable and supportive others may have negative responses to the victim's need for expressing emotions. It is generally believed that women are more likely than men to seek such support and to express their emotions when dealing with a stressful experience. It could therefore be assumed that they are also more sensitive to social barriers to emotional expression and to be adversely affected by them. While this may be the stereotype, there is some evidence to suggest that this may not always be the case and that the impact of such negative social support may depend on its source. The present study examined gender differences in emotional expressivity and perceptions of social barriers to emotional expression from spouse versus other sources. It further examined whether gender moderated the relations between perception of such barriers and distress in a sample of 82 patients with gynaecological or prostate cancer.

Emotional expression and social support

Emotional expression has been found to be associated with a variety of mental and physical health benefits. For example, a large number of studies have shown that individuals who write about their emotions regarding traumatic experiences exhibit enhanced psychological and physical well-being (e.g., Pennebaker, 1997, for a review). Emotionally expressive coping has also been associated with better psychological adjustment to breast cancer and enhanced physical health (Stanton *et al.*, 2000). Furthermore, women with high emotional expressivity, a dispositional tendency to outwardly display one's emotions (Kring, Smith, & Neale, 1994), were found to report lower distress in relation to intrusive thoughts about breast cancer (Zakowski, Valdimarsdottir, & Bovbjerg, 2001). Emotional inhibition, on the other hand, may have adverse effects both in healthy individuals and individuals with chronic illnesses, most notably cancer (e.g., Gross, 1989).

The benefits of emotional expression are often obtained by talking to members of one's social support network. Indeed, one of the main functions that social support serves is to provide the individual with the opportunity to discuss his/her feelings. Social support is an important predictor of mental and physical health; for example, individuals with higher support are healthier and have lower mortality rate from all causes (e.g., Berkman, Leo-Summers, & Horwitz, 1992; House Landis, & Umberson, 1988; Orth-Gomer, Rosengren, & Wilhelmsen, 1993). 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).

Negative social interactions and social constraints on expression

However, one's social network is not always helpful in times of crisis. In fact, behaviours intended to be supportive may be perceived as unhelpful by the patient and may thus have negative consequences. Such negative social interactions can take on different forms, such as criticism, giving unsolicited advice, forced cheerfulness, avoidance or withdrawal (Dakof & Taylor, 1990; Manne, 1998; Manne, Alfieri, Taylor, & Dougherty, 1999; Wortman, & Dunkel-Schetter, 1987; Wortman & Lehman, 1985). Such negative

social behaviours may stem from various sources, including family members, friends, co-workers and spouses or partners, and the importance of these behaviours in the patient's psychological adjustment may depend on that source.

Much of the research on the effects of negative social interactions in cancer patients has focused on the marital relationship. Marital partners are often the most involved in the patient's illness and are called upon for provision of caregiving and emotional support. However, the demands put on the spouse are often overwhelming and spouses may experience significant distress themselves (e.g., Northouse, 1990). This may result in negative responses, such as criticism and avoidance, which have been associated with negative moods in patients diagnosed with various types of cancer (e.g., Manne, Pape, Taylor, & Dougherty, 1999; Manne, Alfieri, Taylor, & Dougherty, 1999). In fact, such negative behaviours may be a more important predictor of the patient's psychological adjustment than positive supportive behaviours. Negative social interactions can also take the form of thwarting the patient's efforts to express his/her emotions about the illness. Such constraints often arise out of the genuine concern of others that talking about the cancer may be detrimental to the patient, resulting in attempts to distract the patient, minimize the problem, or avoid the topic of cancer altogether (e.g., Dakof & Taylor, 1990; Wortman & Dunkel-Schetter, 1987). These efforts by members of the social support network to protect the patient seem misguided, however, as patients often report this to be a source of distress when they feel that their efforts to disclose their true emotions are met with resistance (e.g., Dakof & Taylor, 1990; Manne, Pape, *et al.*, 1999; Ramati & Zakowski, 2001).

Gender differences in emotional expression and need for support

It is widely held that men are less likely than women to express their emotions. Studies have found such differences using a variety of measures including self-report, observer ratings of expressive behaviours and electromyography (e.g., Greenwald, Cook, & Lang, 1989; Gross & John, 1995; Kring & Gordon, 1998; Kring *et al.*, 1994). However, what needs to be examined is the question of whether men are also less likely than women to perceive barriers to emotional expression from their spouse and other members of their support network and whether they are less likely to be adversely affected by such negative social behaviours. Regarding the first question, one may argue that given that men are generally viewed as being less likely to express their emotions, they may also be less likely to receive emotional support that allows them to do so. Conversely, if they do not want to express their emotions they may also be less likely to *perceive* any barriers to expression, as they may not consider such negative behaviours on the part of others to be a problem. Previous research on perceptions of support is mixed. While some studies have found no gender differences in perceived social support or conflict from spouse (e.g., Baider *et al.*, 1996; Manne, Alfieri *et al.*, 1999; Manne, Pape *et al.*, 1999; Turner, 1994), others have reported women to be less satisfied with the marital relationship and to perceive open communication with their spouse to be more difficult when dealing with the stress of cancer (e.g., Keller, Henrich, Sellschopp, & Beutel, 1996; Northouse, Mood, Templin, Mellon, & George, 2000). However, gender differences in perceptions of social barriers to expression have not been examined directly.

With respect to the second question, the relations between perceived barriers and distress may depend on the source of negative social interactions. The impact of negative social interactions may be especially detrimental if they stem from a person who presents a major or exclusive source of support to the support recipient. Men have

been shown to derive the greatest emotional support from their spouse or partner, while women tend to be more likely to draw on other sources of support. In general, men derive more positive support from their spouses than do women across all age groups (Lynch, 1998). Furthermore, it has been found that male cancer patients more often confide exclusively in their spouse, while female patients tend to confide in a larger number of people, including family and friends (Harrison, Maguire, & Pitceathly, 1995). This also appears to be the case in non-patient populations (e.g., Edwards, Nazroo, & Brown, 1998; Turner, 1994).

It may thus be argued that men may be more likely to be adversely affected by withdrawal of support or negative behaviours from the spouse or partner, whereas women may be more likely to suffer if they experience negative social interactions from other sources. Research has mostly focused on the effects of positive support and findings have been mixed on this issue. One study examined the relations between spousal emotional support and distress in cancer patients and found a significant negative correlation for male, but not for female, patients, suggesting that only men were adversely affected by low emotional support from their spouse (Keller *et al.*, 1996). In the laboratory, men who were supported by their partner in anticipation of a stressor had lower levels of cortisol (an indication of lower stress), whereas women's cortisol levels were not affected by their partner's support (Kirschbaum, Klauer, Filipp, & Hellhammer, 1995). In addition, the fact that men tend to draw greater health benefits from marriage than do women and that men suffer more as a result of the death of their spouse is often explained by the fact that the wife is a man's sole confidante (e.g., Berkman & Syme, 1979; Stroebe & Stroebe, 1983). Men may thus be more distressed by negative spousal support than are women. Not all findings are consistent with this idea, however. Turner (1994), for example, found that women reported higher depression in association with marital conflict (disagreements with spouse) than did men. To date, no studies have examined gender differences in the relations between barriers to emotional expression and distress.

Finally, when examining these associations it may also be important to take gender differences in dispositional emotional expressivity into consideration. For example, individuals who have a high need for emotional expression may not only be more likely to perceive social barriers to expression but may also be more adversely affected by these barriers. Expression may be their predominant coping mechanism, and when this expression is blocked by an unsupportive social environment, psychological adjustment to the stressful event may be inhibited.

The present study examined emotional expressivity, perceived barriers to emotional expression about cancer (social constraints), and distress (general moods and intrusive thoughts about cancer) in 82 men and women diagnosed with cancer. Based on the literature reviewed above, we examined the following questions regarding emotional expression:

- (1) Are female cancer patients more emotionally expressive than male patients?
- (2) Do male and female cancer patients differ with respect to their perceptions of social constraints from spouse/partner and other individuals in their support network?
- (3) Do men experience more distress in relation to social constraints from spouse/partner than do women?
- (4) Do women experience more distress in relation to social constraints from supportive others (other than their spouse/partner) than men?

- (5) Can these putative gender differences be explained by differences in emotional expressivity?

Method

Participants

Patients who had been diagnosed with cancer within the past 5 years were recruited from oncology clinics in the Chicago and Milwaukee metropolitan areas for a broader study examining the effects of psychosocial factors and individual differences on quality of life. The present data are taken from assessments on 41 men diagnosed with prostate cancer and 41 women with gynaecological cancer. One male patient was excluded from data analyses because his scores were over three standard deviations above the mean on three of the main study variables, thus reducing the final *N* to 81. Gynaecological cancers included endometrial (41.5%), ovarian (29.3%), cervical (14.6%), fallopian (2.4%), vulvar (2.4%) and trophoblastic disease (2.4%), and three patients had more than one type of cancer (7.3%). Gynaecological cancer ranged from Stage 1 to Stage IV diagnoses, with the majority of patients (53.7%) diagnosed with Stage I disease (we were unable to ascertain disease stage for six of the patients). Prostate cancer cases were graded according to a Gleason score (a measure of the degree of malignancy of the cancer cells which can range from 2 to 10) which we were able to verify for 31 of the participants. Gleason scores in the present sample ranged from 3 to 8 with the majority of patients diagnosed as Stage 6 (37.5%) or Stage 7 (25%). Patients were considered eligible for the study if they had a first time diagnosis of prostate or gynaecological cancer, had completed active cancer treatment, had no evidence of psychiatric problems or any current life-threatening disease other than cancer, and were able to read and write fluently in English. In addition, for inclusion in the present data analyses, participants had to have a current spouse or sexual partner. Participants were between 25 and 81 years old ($M = 59.01$, $SD = 10.78$), 43% had a college degree, 57% were currently employed outside the home, 94% were Caucasian and 96% were currently married. Patients were diagnosed between 2 months to 5 years prior to study participation ($M = 1.27$ years, $SD = 1.13$). They had received various treatments for their cancer including surgery (85.2%; of the gynaecological cancer patients the majority underwent hysterectomy or hysterectomy with oophorectomy ($n = 34$, 83%), or other ($n = 3$, 7.3%); of the prostate cancer patients the majority underwent radical prostatectomy ($n = 31$, 77%) [information on type of surgery was not available for two of the gynaecological cancer patients], chemotherapy (23.5%) and radiation therapy (19.8%).

Procedures

Patients who had been diagnosed with cancer within the past 5 years were identified by their treating physician. Those who indicated interest in study participation were contacted by a member of the research group who explained the study and screened the patient for eligibility. Of the patients who were initially screened for the study, 24% declined participation. The most common reason cited was lack of interest or time (71%), being too ill (10%) or dealing with other problems (5%). Participants gave written informed consent and completed several questionnaires which were sent by mail. Completed forms were returned to the research office in self-addressed, stamped

envelopes that were provided to the participants. The questionnaires that were used for the present analyses are described below.

Measures

Demographic questionnaire

This face-valid questionnaire includes questions on basic demographic information including age, ethnic group, education and marital status.

Medical history questionnaire

Patients were asked to complete basic medical information with respect to their cancer including date of diagnosis, tumour site, treatments received and other concurrent chronic health problems. This information was verified via patients' medical charts.

Social constraints (Lepore & Ituarte, 1999)

This is a 15-item scale assessing participants' perceived inadequacy of social support resulting in a reluctance to express thoughts and feelings about a specific stressor, in this case their cancer experience. Examples of items include 'How often did your spouse avoid you?', 'How often did your spouse minimize your problems', 'How often did your spouse tell you to try not to think about your cancer?', and 'How often did your spouse make you feel as though you had to keep feelings about your cancer to yourself, because they made him/her feel uncomfortable?' Previous research shows an internal consistency of $\alpha = .88-.92$ (Lepore & Ituarte, 1999). Two versions of this form were included in the present study, one asking about constraints from the spouse or partner, the second asking about constraints from individuals other than the spouse/partner. Reliability for the two scales in the present study was $\alpha = .79$ and $.73$ for the 'spouse/partner' and the 'other' form, respectively. Participants were asked to rate each item on a 4-point scale regarding how they felt during the past week. Possible scores on this questionnaire range from 15 (low constraints) to 60 (high constraints). This questionnaire has been used with cancer patients (Lepore & Ituarte, 1999).

Emotional Expressivity Scale (EES; Kring et al., 1994)

The EES assesses a dispositional tendency to outwardly display emotions. This is a general measure of emotional expression in that it is not specific to any particular type of emotion (anger, sadness, etc.), valence (positive or negative) or mode of expression (e.g., verbal, non-verbal). Participants rate the extent to which each of 17 statements applies to them on a scale from 1 (never) to 6 (always) with a possible range of total score values from 17 (low expressivity) to 102 (high expressivity). The scale was developed and validated in several studies using college students and community residents (Kring et al., 1994). Convergent and discriminant validity as well as criterion validity have been established in a number of studies. Reliability was found to be acceptable with an average α of $.91$ across seven administrations and a 4-week test-retest reliability of $.90$ (Kring et al., 1994).

Profile of Mood States (POMS; McNair, Lorr, & Droppelman, 1971)

This questionnaire assessed participants' moods by asking them to rate each of 65 adjectives on a Likert-type scale. The POMS yields six subscales (tension-anxiety,

depression-dejection, anger-hostility, vigour activity, fatigue-inertia, confusion-bewilderment) and a total mood disturbance (TMD) score. Test-retest reliability for each of the subscales ranges from $r = .65$ to $.74$, and validity has been demonstrated (McNair *et al.*, 1971). Only the TMD score was used in the present analyses. Possible TMD scores range from 0 to 260. Participants were asked to rate how they felt 'in the past week including today'. This scale is used widely as a measure of current distress and has been used extensively with cancer patients.

Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979)

This scale assessed frequency of intrusive thoughts and avoidance 'over the past week including today'. The intrusive thoughts subscale was used for the present study. The questionnaire was designed to be anchored to a specific context, which in the case of this study was cancer. Frequency on each item is endorsed as 0 = not at all, 1 = rarely, 3 = sometimes and 5 = often. The possible scores for the intrusive thoughts subscale range from 0 to 35. Test-retest reliability for this subscale is acceptable ($r = .89$) (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).

Results

First, we examined relations between background variables (demographic and medical information) and major study variables (see Table 1). Significant differences by gender were observed on age and education. Men were significantly older and were more likely to hold a college degree. Medical data showed that women were significantly more likely to have undergone surgery to treat their cancer. None of the other medical or demographic variables showed significant gender differences. Age was significantly negatively correlated with total mood disturbance (TMD) scores, intrusive thoughts, social constraints from partner, social constraints from others, and emotional expressivity (see Table 2). Thus, age was used as a covariate as it may account for any gender differences observed in study variables. Being employed outside the home was also associated with higher emotional expressivity scores, $F(1, 78) = 4.02, p < .05$. None of the other background variables were significantly associated with any of the study variables including emotional expressivity, social constraints, mood disturbance and intrusive thoughts (see Table 2 for correlations of all study variables).

To examine the first two questions regarding gender differences on expressivity and perceptions of social constraints, analysis of covariance (covarying for age) was used. A trend for general emotional expressivity was observed, $F(1, 78) = 3.7, p = .058$, with women exhibiting higher self-reported expressivity. There were no significant differences in perceptions of constraints from either source (see Table 3 for means by gender on all study measures).

Multiple regression analyses were conducted to examine whether men and women had different levels of distress as a function of social constraints (see Tables 4 and 5). Social constraints scores were first centred around 0 (Aiken & West, 1991). First, we examined social constraints from spouse/partner. Age was entered in the first step, followed by gender in the second step, social constraints in the third, and finally the cross-product of social constraints by gender. Using TMD on the POMS as a dependent variable, significant main effects for age and social constraints from spouse were observed, accounting for 5% and 14% of the variance, respectively. The interaction of

Table 1. Demographic and medical data by gender

	Women (N = 41)	Men (N = 40)	p value
Demographics			
Age	55.05 (12.22)	63.01 (7.22)	<.001
Education (% college degree)	22%	65%	<.001
Marital status (% currently married)	98%	95%	n.s.
Employment (% employed outside the home)	57%	57%	n.s.
Ethnicity (% Caucasian)	95%	92%	n.s.
Medical history			
Surgery	92.7%	77%	<.05
Time since diagnosis in years	1.30 (1.08)	1.23 (1.19)	n.s.
Other chronic illnesses	2.5%	7.7%	n.s.

Table 2. Zero-order correlations among main study variables

	1	2	3	4	5	6
1. Age						
2. Time since diagnosis	.19					
3. Social constraints (partner)	-.26*	-.15				
4. Social constraints (other)	-.41**	-.15	.50**			
5. POMS	-.23*	-.14	.40**	.41**		
6. Intrusive thoughts	-.26*	-.08	.20	.44**	.53**	
7. Emotional expressivity	-.24*	-.01	.03	.05	-.12	.01

* $p < .05$, ** $p < .01$.

Table 3. Means (SDs) of independent and dependent variables by gender

	Women (N = 41)	Men (N = 40)	p value
Emotional expressivity	68.66 (11.21)	62.05 (11.61)	.058
POMS (TMD)	42.56 (21.98)	45.75 (31.21)	n.s.
Intrusive thoughts	6.63 (6.95)	7.72 (7.74)	n.s.
Social constraints (partner)	23.44 (7.39)	21.40 (5.92)	n.s.
Social constraints (other)	23.32 (7.90)	20.42 (6.10)	n.s.

Notes: POMS = profile of mood states; TMD = total mood disturbance.

constraints $\times$ gender was also significant, accounting for an additional 5% of the variance in mood. The analysis was repeated using intrusive thoughts about cancer as a dependent variable. Age accounted for a significant 6% of the variance; however, none of the other main effects were significant. Again, the gender $\times$ constraints interaction was significant, contributing about 6% to the variance in intrusive thoughts. To examine the direction of the interaction effects, we plotted the regression lines as

recommended by Aiken and West (1991). As can be seen in Figs 1 and 2, men had higher levels of mood disturbance and intrusive thoughts when they perceived high constraints from their spouse/partner, whereas women exhibited little or no increase in distress with increased constraints. Indeed, men who perceived high levels of social constraints exhibited the highest levels of distress relative to the other patients in the study. When spousal constraints were perceived to be low, both men and women exhibited relatively low levels of distress.

The multiple regression analyses were repeated using social constraints from others as the predictor variable. Significant main effects were observed for age and constraints on POMS mood disturbance, explaining 5% and 13% of the variance, respectively. The constraints $\times$ gender interaction did not approach significance in this case. Similar findings were observed when intrusive thoughts were used as a dependent variable, with significant main effects for age and constraints (6% and 15% of the variance explained), but no significant interaction.

Finally, we were interested in examining whether emotional expressivity may account for gender differences in the relations between constraints and distress. Correlations revealed no significant associations between emotional expressivity and social constraints or distress measures (see Table 2), thus no further analyses were necessary.

Table 4. Multiple regression of each dependent variable on age, gender, social constraints (partner) and gender by constraints cross-product

Social constraints (partner)	R^2	ΔR^2	β	F	d.f.
POMS					
1. Age	.05	.05	-.23	4.25*	1,79
2. Gender	.07	.02	.17	2.04	1,78
3. Social constraints (partner)	.21	.14	.38	12.96**	1,77
4. Gender $\times$ constraints	.26	.05	.29	5.14*	1,76
Intrusive thoughts					
1. Age	.06	.06	-.25	5.47*	1,79
2. Gender	.10	.04	.20	2.90	1,78
3. Social constraints (partner)	.12	.02	.16	2.10	1,77
4. Gender $\times$ constraints	.18	.06	.30	5.00*	1,76

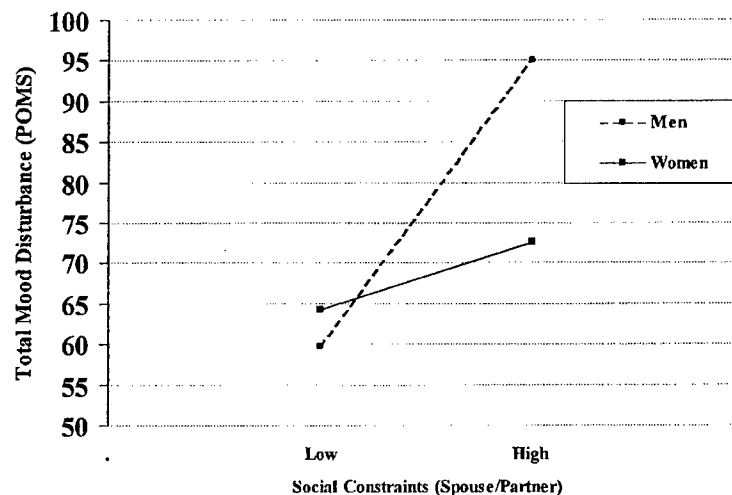
* $p < .04$; ** $p < .001$.

Discussion

The present study examined gender differences in general emotional expressivity, perceived social barriers to emotional expression (social constraints) and relations between these constraints and distress among patients diagnosed with cancer. Results showed a trend towards greater emotional expressivity in women as compared to men. There were no significant differences between men and women in their perceptions of perceived social constraints from spouse/partner or others. Men experienced significantly higher levels of distress in association with social constraints from spouse/partner than did women; however, there were no gender differences in distress in association with constraints from other sources.

Table 5. Multiple regression of each dependent variable on age, gender, social constraints (others) and gender by constraints cross-product

Social constraints (others)	R^2	ΔR^2	β	F	d.f.
POMS					
1. Age	.05	.05	-.23	4.25*	1,79
2. Gender	.07	.02	.17	2.04	1,78
3. Social constraints (others)	.20	.13	.39	12.50**	1,77
4. Gender $\times$ constraints	.22	.02	.17	1.66	1,76
Intrusive thoughts					
1. Age	.06	.06	-.25	5.47*	1,79
2. Gender	.10	.04	.20	2.90	1,78
3. Social constraints (others)	.25	.15	.42	15.19**	1,77
4. Gender $\times$ constraints	.25	.00	.09	.54	1,76

* $p < .04$; ** $p < .001$.**Figure 1.** Interactions between gender and perceived social constraints from spouse/partner on total mood disturbance scores of the Profile of Mood States. Low = -1SD, High = +1SD.

Previous studies have shown that women tend to be more emotionally expressive than men and the present findings showed a similar trend in a sample of cancer patients. However, the findings also corroborated previous contentions that this gender difference is relatively small and may be of little consequence for clinical interventions. More importantly, this did not translate into lower reporting of mood disturbance and intrusive cognitions in male patients as there were no significant gender differences on these scores. The few studies that have focused on gender differences in distress in cancer patients have shown inconclusive results. While some found women to report higher levels of distress and depression, which may be due to gender differences in reporting of negative emotions (see Keller *et al.*, 1996), others found no gender differences in distress (e.g., Cassileth *et al.*, 1985). As has been suggested by other

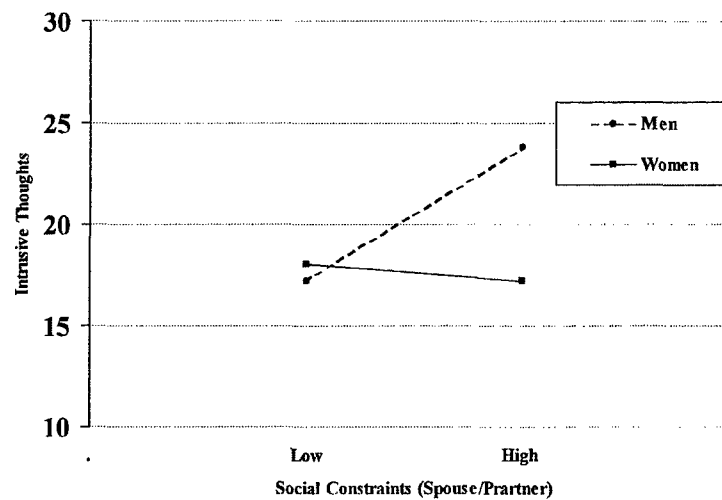


Figure 2. Interactions between gender and perceived social constraints from spouse/partner on intrusive thoughts. Low = - 1SD, High = + 1SD.

authors, gender differences in emotional disclosure are not as large as theory and stereotype might have it and may thus be of little practical value (Dindia & Allen, 1992). It may be more productive to examine the conditions under which emotions are expressed or inhibited by men and women and the psychological consequences that ensue from such expression or inhibition.

The present study therefore examined barriers to emotional expression afforded by the social environment, specifically social constraints that inhibit patients' expression of emotions regarding their cancer experience. Interestingly, we observed no significant gender differences in perceptions of such barriers from spouse/partner and other support sources. This is compatible with previous findings on perceptions of spouse criticism (Manne, Pape, *et al.*, 1999) and demandingness (Lynch, 1998), two other forms of negative social interactions. Based on the assumption that men do not wish to express their emotions, one may have expected lower perceptions of constraints on expression as this may not be something that is viewed as problematic in patients who have relatively little desire to talk about their cancer experience. However, our data suggest that, in fact, men who are dealing with the stress of cancer may perceive similar constraints. Gender differences in the need and desire of cancer patients to express their emotions about their cancer experiences should be more directly assessed in future studies.

The most interesting finding in this study is that men experienced higher general mood disturbance and intrusive thoughts about cancer when confronted with social constraints from their spouse than did women. No such gender differences were observed when constraints from other sources were considered. One explanation for this can be found in the social support literature. Research has shown that men tend to derive greater support from their spouses than women and that they are less likely to have a confidante other than their spouse (e.g., Keller *et al.*, 1996). Thus, men tend to have their spouse or partner as their sole source of emotional support to whom they will express their thoughts and emotions regarding stressful experiences. Consequently, men may be particularly distressed when they perceive that their spouse is unavailable

or responds in a negative and unhelpful manner to their efforts at expressing their emotions regarding their illness. Since women, on the other hand, do not necessarily consider their spouse or partner as their primary confidant, constraints from that source may not be as distressing to the female cancer patient. In addition, as women tend to have a number of other sources of support (e.g., friends), they may be more likely to fall back on other confidants outside the conjugal relationship when they perceive constraints from their spouse/partner.

Conversely, because women are thought to seek support from individuals outside the dyadic relationship, we expected women to have higher distress than men when perceiving high constraints from other individuals in their support network. Interestingly, we found no gender differences in distress, suggesting that male and female patients may be equally affected by constraints from others. The main effects in fact suggest that social constraints from others were associated with heightened distress regardless of the patient's gender. We can only speculate on the reasons for this. It is possible that cancer patients seek support from various sources and that this is not a gender-specific phenomenon. Therefore, perceptions of negative responses may be equally associated with distress in both genders. Because we assessed social constraints across a variety of sources of support (other than spouse) we were unable to separate constraints from friends, family members, co-workers or other important sources which would have allowed us to examine whether constraints from one support source may be compensated by support from another. In fact, studies have suggested that support from one source can buffer the distress associated with constraints from another source (e.g., Lepore, 1992). It is possible that a more detailed analysis of individual support provision would have shed light on additional gender differences. Because our measure of social constraints from 'others' was very general, the lack of a significant gender difference in distress in association with this measure should be interpreted with caution and is perhaps less conclusive than our finding regarding constraints from spouse.

Finally, we argued that the relationship between social constraints and psychological adjustment may be partly dependent on the individual's tendency for expression, such that individuals who have a greater tendency to express themselves and thus have greater needs for support and encouragement in expression may be more likely to be adversely affected by social constraints. Given that women have a slightly higher dispositional tendency to express their emotions, this may therefore have presented an alternative explanation for gender differences in the relations between constraints and distress. However, we found that men reported higher distress in association with constraints than did women and that expressivity was not significantly associated with constraints or distress. We therefore conclude that expressivity did not influence the results in this study. It should be noted that the measure we used was one of general expressivity and a measure of cancer-specific emotional expression may have yielded different results.

Interpretation regarding the direction of causality of our findings has the same limitations as those of any cross-sectional study. An alternative explanation for our findings should thus be borne in mind. Specifically, elevated distress may lead to higher levels of perceived social constraints from the partner. It is conceivable that this association may be greater in men because of gender role expectations regarding social support or because men express their distress in a manner that causes withdrawal of support from the spouse. A further alternative explanation may be that both self-reported distress and self-reported social constraints may be caused by a third variable. If this were the case, this third variable would appear to have greater influence in men

than in women. While these are important alternatives to consider, only prospective or experimental studies may be able to compare these alternative hypotheses. However, our interpretation of the current findings is sufficiently compelling to provide a basis for future research on gender differences in the effects of social barriers to emotional expression in cancer patients. Prospective studies will help in uncovering the mechanisms by which men and women are affected by these barriers. Recent data suggest that avoidance of cancer-related cognitions may play a role in the detrimental effects of social constraints on cancer patients' emotional well-being (Ramati & Zakowski, 2001). The present study was not able to address the reasons for social constraints or potential mechanisms for their relations with distress. It is conceivable that men have higher expectations of support from a female spouse than do women from a male partner. Thus, men may be more disappointed by their wife's negative responses than are women because women do not expect as much support from their husband. Research on social support has also raised the question of whether gender differences in the effects of support are due to gender of the recipient or gender of the support provider. For example, one experimental study suggested that support provided by women was more effective in mitigating distress than support provided by men regardless of the recipient's gender (Glynn, Christenfeld, & Gerin, 1999). Similarly, it could be argued that negative responses from a woman have a greater impact than negative responses from a man, regardless of the recipient's gender. Future studies could address this issue by examining perceived barriers from specific male and female sources of support in addition to the spouse/partner.

The main variable of interest in this study was the patient's perception of social barriers to expression. This is based on the notion that it is the subjective appraisal of a situation rather than its objective characteristics that determine an individual's psychological well-being (e.g., Lazarus & Folkman, 1984). A question that is of some practical importance for psychological interventions is whether the patient's perception of constraints is in fact an accurate reflection of the partner's actual behaviours. There is some research to suggest that this may be a difficult question to answer. For example, one study showed that couples largely disagreed on their perception of open communication with each other regarding the patient's cancer (Keller *et al.*, 1996), suggesting that perceptions of constraints are highly idiosyncratic and subjective.

The gender differences seen in this study may be due to the fact that men and women had been diagnosed with different types of cancer. We chose gynaecological and prostate cancer patients because of the similarities in some of the issues that these patients are facing, including problems regarding sexuality, which would be particularly relevant to their relationship with their spouse/partner. Relevant to this issue is the observation that there were no systematic gender differences in ascertainable disease characteristics and, perhaps more importantly, there were no significant gender differences in perceived social constraints, moods and cancer-specific intrusive thoughts. This suggests that the men and women in this study may be quite similar in their illness experience and the possible confound of cancer type may be of lesser concern. While future studies could compare men and women afflicted with the same type of cancer, it may be argued that even when diagnosed with the same cancer type, men and women may be affected in different ways both physically and psychologically, despite the comparability of the medical diagnosis.

Another question to be raised regards a possible self-selection bias. One should consider the possibility that a study that examines psychosocial issues in cancer may discourage men who prefer not to discuss their emotions from participating. Indeed, we

found that more men than women declined participation (34% and 12.5%, respectively). There were no ascertainable differences in reasons for refusal and the differential rate could have been due to a variety of factors including patient's rapport with the referring physician and recruitment procedures at different hospitals. Selection biases are a concern in any type of study that examines individual differences and are difficult to circumvent.

The findings from the present study contribute some important insights into the needs of cancer patients to communicate their emotions regarding their illness. Previous research has shown that men are less likely in general to express their emotions. While it is often concluded that men *prefer* not to express their emotions and are thus less likely to seek opportunities in their social environment for such expression (e.g., confidants, support groups), little empirical evidence exists for this point of view. The present study in fact suggests that men may be particularly vulnerable to social constraints from their spouse or partner. The findings from this study point to the importance of further research examining the needs for emotional expression in male as in female cancer patients. If further studies support the idea that emotional expression needs are not met by the patients' social support network, interventions designed to help patients communicate their emotions both in the dyadic relationship as well as with other sources of support may prove to be helpful. In addition, it may be important to include the partner in the intervention to increase his/her awareness of the patient's need for talking about the cancer experience. Furthermore, patients may benefit from interventions that help them identify additional sources of support in cases where the spouse/partner is unable to act as a consistent support provider. Future studies should examine the various reasons for social barriers to expression such that interventions can target those barriers more effectively.

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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.

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

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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 ($r_s = .68$ 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 ($r_s = .89$ 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.

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*

Table 1
Demographic and Medical Data by Experimental Condition

Characteristic	Experimental group		Control group		n
	M	%	M	%	
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 $SD = 1.13$.

($n = 42$). 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 condition¹ 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 $\times$ 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 (<i>n</i> = 62)		Control group (<i>n</i> = 42)		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Main study					
GSI baseline	0.42	0.44	0.33	0.29	<i>ns</i>
GSI follow-up	0.35	0.40	0.34	0.40	<i>ns</i>
Avoidance baseline	9.76	9.51	8.24	8.65	<i>ns</i>
Avoidance follow-up	7.23	8.27	6.55	8.57	<i>ns</i>
Intrusive thoughts baseline	7.31	7.92	6.21	7.52	<i>ns</i>
Intrusive thoughts follow-up	6.53	7.30	4.98	6.33	<i>ns</i>
Social constraints baseline	22.48	7.76	21.14	6.10	<i>ns</i>
Social constraints follow-up	20.51	7.66	19.71	6.41	<i>ns</i>
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 $\times$ 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	<i>F</i> (<i>dfs</i>)	<i>p</i>	Δr^2	β	<i>F</i> (<i>dfs</i>)	<i>p</i>
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 $\times$ Condition	.016	-.507	4.45 (1, 99)	<.04	.033	-.714	6.25 (1, 99)	<.02

Note. GSI = General Severity Index.

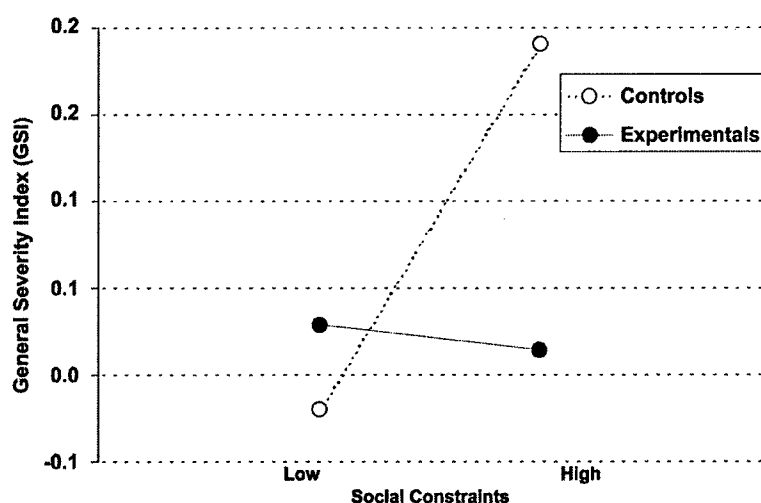


Figure 1. Interaction of baseline social constraints with experimental condition: effects on residualized General Severity Index scores at 6-month follow-up. Low and high social constraint scores reflect one standard deviation below and above the mean, respectively.

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 $\times$ 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 $\times$ 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 $\times$ 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 $\times$ 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 $\times$ 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 (dfs)	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 $\times$ 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 $\times$ 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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19. Instructions to Publishers
a. Complete and file one copy of this form with your postmaster annually on or before October 1. Keep a copy of the completed form for your records.
b. In cases where the distributor or security holder is a trustee, include in item 15b and 15c the name of the person or corporation for whom the trustee is acting. Also include the name and address of individuals who are shareholders who own or hold 1 percent or more of the total amount of bonds, mortgages, or other securities of the publishing corporation. In item 15, if none, check the box. Use item 15b if none.
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i. Form 3526, October 2004 version.

13. Publication Title
Health Psychology

14. Issue Date for Circulation Data Below
July 2004

15. Number of Copies of This Issue Published in This Issue Date
6,392

16. Extent and Nature of Circulation
a. Total Number of Copies (Net press run)
6,392

b. Paid and Unpaid Circulation
i. Paid (Include subscription sales and other paid circulation)
580

ii. Unpaid (Include library and other unpaid circulation)
5,812

c. Total Paid and Unpaid Circulation
6,392

d. Copies not Distributed
174

e. Total Paid and Unpaid Circulation (Sum of 15b, 15c, and 15d)
6,218

f. Total Paid and Unpaid Circulation (Sum of 15b, 15c, and 15d)
6,218

17. Publication of Statement of Ownership
[X] Publication of Statement of Ownership required by law (Check one)
[] Publication not required by law

18. Signature and Title of Editor, Publisher, Business Manager, or Owner
Date
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