

Disclosure of Traumas and Immune Function: Health Implications for Psychotherapy

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Can psychotherapy reduce the incidence of health problems? A general model of psychosomatics assumes that inhibiting or holding back one's thoughts, feelings, and behaviors is associated with long-term stress and disease. Actively confronting upsetting experiences—through writing or talking—is hypothesized to reduce the negative effects of inhibition. Fifty healthy undergraduates were assigned to write about either traumatic experiences or superficial topics for 4 consecutive days. Two measures of cellular immune-system function and health center visits suggested that confronting traumatic experiences was physically beneficial. The implications for psychotherapy as a preventive treatment for health problems are discussed.

There is little doubt that psychotherapy reduces subjective distress and yields positive behavioral outcomes. In recent years, a small group of researchers has sought to learn whether psychotherapy can also reduce health problems. Two promising reviews have indicated that the use of mental health services is associated with fewer medical visits, fewer days of hospitalization, and lower overall medical costs. In a summary of 15 studies published between 1965 and 1980, Mumford, Schlesinger, and Glass (1981) found that individuals who underwent psychotherapy evidenced a 13% decrease in medical utilization relative to nonpsychotherapy control subjects. Similarly, in a review of 13 studies of mental health services that were introduced into organizations, Jones and Vischi (1980) found that psychotherapy was associated with a 20% drop in medical utilization.

Although promising, these findings leave open the question of why medical use drops following psychotherapy. Kiesler (1983), for example, urged caution in blindly accepting a causal interpretation because we do not know if these effects generalize across practitioners and sites. Furthermore, individuals who seek psychotherapy in an organized health system, such as a

Health Maintenance Organization (HMO), tend to be some of the highest users of the medical system (see also Tessler, Mechanic, & Diamond, 1976). Finally, these studies have not distinguished between actual health problems and unnecessary medical visits.

Ironically, in the fields of psychosomatics and health psychology, researchers have long known that psychological disturbance can lead to health problems. Alexander (1950), Selye (1976), and other pioneers have provided overwhelming evidence that psychological conflict, anxiety, and stress can cause or exacerbate disease processes. It follows that the reduction of conflict or stress should reduce illness.

An important predictor of illness is the way in which individuals cope with traumatic experiences. It has been well-documented that individuals who have suffered a major upheaval, such as the death of a spouse or a divorce, are more vulnerable to a variety of major and minor illnesses. However, the adverse effects of stress can be buffered by such things as a social support network (e.g., Cohen & Syme, 1985; Swann & Pridmore, 1985) and by a predisposition toward hardiness (Kobasa, 1982).

A common theme in the psychotherapy literature is that individuals tend to deal with trauma most effectively if they can understand and assimilate it. Indeed, Breuer and Freud (1895/1966), in their development of the cathartic method, emphasized the value of talking about the thoughts and feelings associated with upsetting events in the reduction of hysterical symptoms. To examine the links between confronting traumatic events and long-term health, Pennebaker and Beall (1986) asked healthy college students to write about either personally traumatic experiences or trivial topics for 4 consecutive days. Subjects who wrote about traumatic events were required to discuss either the relevant facts (*trauma-fact condition*), their feelings about the events (*trauma-emotion*), or both their thoughts and feelings (*trauma-combination*). In the months following the

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study, subjects in the trauma-combination condition visited the student health center for illness significantly less often than people in any of the other conditions.

Confronting a trauma may be beneficial from at least two perspectives. First, individuals no longer need to actively inhibit or hold back their thoughts and feelings from others. Indeed, several studies have indicated that actively inhibiting ongoing behavior is associated with both short-term autonomic activity (cf. Fowles, 1980; Gray, 1975) and long-term stress-related disease (Pennebaker & Susman, in press). Confronting a trauma, then, may reduce the long-term work of inhibition. Second, by confronting the trauma, individuals may assimilate, reframe, or find meaning in the event (Horowitz, 1976; Meichenbaum, 1977; Silver, Boon, & Stones, 1983).

A major problem in evaluating the health effects of confronting a trauma is that most measures are relatively subjective or are susceptible to demand characteristics, such as self-reported symptoms or physician visits. Furthermore, studies such as these fail to identify the underlying mechanisms that influence health. Recent research in psychoneuroimmunology has indicated that the central nervous system can directly influence the functioning of the immune system. For example, the psychological stress associated with exams, loneliness, and divorce can lead to adverse immunological changes (e.g., Bartrop, Luckhurst, Lazarus, Kiloh, & Penny, 1977; F. Cohen, 1980; Kiecolt-Glaser, Garner, Speicher, Penn, & Glaser, 1984; Kiecolt-Glaser et al., 1987). Similarly, relaxation interventions can enhance some aspects of immunocompetence (Kiecolt-Glaser et al., 1985).

Although there is no single, general measure of immune function, many psychoimmunological studies have examined the lymphocyte (white blood cell) response to stimulation by substances foreign to the body, called *mitogens*. *Blastogenesis*, the measurement of the proliferation of lymphocytes in response to stimulation, is thought to provide an in vitro model of the body's response to challenge by infectious agents, such as bacteria or viruses. Because different mitogens stimulate different subpopulations of lymphocytes, two types of mitogens—phytohemagglutinin (PHA) and concanavalin A (ConA)—were used. Both PHA and ConA stimulate the proliferation of T-lymphocytes. Whereas PHA stimulates the proliferation of helper cells, ConA stimulates both helper and suppressor T-cells (e.g., Ader, 1981; Glaser et al., 1985; Reinherz & Schlossman, 1980).

The present project examined the effects of writing about a traumatic experience on immunological function and on other measures of distress. We predicted that individuals assigned to write about traumatic experience would demonstrate a heightened proliferative response to PHA and ConA assays relative to control subjects who merely wrote about superficial topics.

Method

Overview

Fifty healthy undergraduates were randomly assigned to write about either personal traumatic events or trivial topics for 20 min on each of 4 consecutive days. Lymphocytes, which were prepared from blood samples obtained the day before, the last day, and 6 weeks after writing, were assayed for their blastogenic response to PHA and ConA. Health

center illness records, self-reports, autonomic measures, and individual difference measures were collected before and during the experiment.

Subjects

Thirty-six women and 14 men who were enrolled in undergraduate psychology courses participated as part of an extra-credit class option. Prior to agreeing to participate, all subjects were told that the experiment might require that they write about extremely personal material and that they have their blood drawn. All subjects participated in the pretest and in the 4 writing days. Two subjects missed the 6-week follow-up blood draw. Two subjects' immunological data were excluded from the analyses: 1 for taking cortisone, the other for pregnancy. In addition, three blood samples for the second draw and one for the third draw were lost during the assaying process.

Procedure

The day prior to the actual writing, subjects met as a group and completed a battery of questionnaires. During the session and after sitting quietly for at least 10 min, subjects' blood pressure levels, heart rates, and skin conductance levels were measured. At assigned times, subjects were escorted to the adjacent Student Health Center building where blood was drawn by the nursing staff. After the blood was drawn and all questionnaires were completed, subjects met individually with the first experimenter, who randomly assigned them to conditions with the provision that an equal ratio of men to women be in each of the two conditions. All subjects were told that they would be required to write about specific topics on each of the following 4 days. Subjects in the trauma condition were informed as follows:

During each of the four writing days, I want you to write about the most traumatic and upsetting experiences of your entire life. You can write on different topics each day or on the same topic for all four days. The important thing is that you write about your deepest thoughts and feelings. Ideally, whatever you write about should deal with an event or experience that you have not talked with others about in detail.

Those in the no-trauma condition were informed that they would be asked to write on an assigned topic during each of the 4 writing days. The experimenter emphasized that subjects were to describe specific objects or events in detail without discussing their own thoughts or feelings.

On each of the 4 writing days, subjects first met individually with the first experimenter, who reiterated the instructions. For subjects in the no-trauma cell, the specific writing topic was assigned. Depending on the day of the study, subjects were variously asked to describe their activities during the day, the most recent social event that they attended, the shoes they were wearing, or their plans for the remainder of the day. Each day, subjects were escorted to individual private rooms by an experimenter blind to condition, where they were given 20 min to write on their assigned topics. Immediately before and after writing, subjects completed a brief questionnaire that assessed their moods and physical symptoms. After writing only, subjects evaluated their day's essay. The questionnaires and writing samples were stapled and deposited in a large box by the subjects as they left.

After writing on the 4th day, blood pressure, heart rate, and skin conductance were measured before subjects went to the health center for the second blood draw. After the draw, subjects completed a brief questionnaire. Six weeks later, subjects returned to the health center, where autonomic levels and blood samples were collected for a third time. Subjects completed a postexperimental questionnaire and were extensively debriefed about the experiment.

At the conclusion of the study, the health center provided data regarding the number of visits each student had made for illness for the 5

months prior to the study and for the 6 weeks of the study. Approximately 3 months after the writing phase of the study, all subjects were mailed a final questionnaire in order to assess the possible long-term effects of the experiment. The long-term follow-up questionnaire included items assessing subjective distress and daily habits (e.g., smoking and exercise patterns) that had been completed earlier in the study. Of the 50 subjects, 2 did not receive the questionnaire (due to incorrectly listed mailing addresses) and 4 failed to return the questionnaire. All subjects were mailed a follow-up letter that provided the study's outcome, their own immune data, and an interpretation of these data. All essays, physiological data, and self-reports included only subject numbers. Immune assays were collected, performed, and analyzed blind to condition.

Immune Assays

In the study, each subject's blood was drawn at the same time each day to control for possible diurnal variations. For each blood draw, whole blood treated with ethylenediaminetetra-acetic acid (EDTA) to prevent clotting was collected from each subject. The blood samples were sent to the laboratory the following morning and assayed for their ability to respond to PHA and ConA (Kiecolt-Glaser et al., 1984). Lymphocytes were separated from whole blood samples on Hypaque-Ficoll gradients.

The PHA and ConA were used at three different concentrations: 5, 10, and 20 $\mu\text{g}/\text{ml}$ for PHA and 2, 5, and 10 $\mu\text{g}/\text{ml}$ for ConA. Each assay was performed in triplicate. Complete medium was used for baseline controls. One tenth milliliter of mitogen was added to 1×10^6 lymphocyte (in 0.1 ml medium) in 96 well plates and was incubated at 37 °C for 48 hr. Fifty microliters of tritiated thymidine (10 $\mu\text{Ci}/\text{ml}$, specific activity 82 Ci/mM) were added to each well and the plates were incubated at 37 °C for 4 hr. Cells were harvested onto GF11A filters. Radioactivity was measured using a Beckman LS7000 scintillation counter. The mean stimulation value (expressed in counts per minute) was subtracted from the control value and transformed to log (base 10).

Results

Three general classes of data were collected: evaluations of and responses to the essays, long-term effects of the experiment, and individual differences mediating responses to the essays. Each will be discussed separately.

Parameters of Essay Writing

Subjects disclosed highly personal and upsetting experiences in the trauma condition. Overall, the primary topics of the essays were coming to college (19%), with 10% focusing on the loss and loneliness associated with leaving home; conflicts associated with members of the opposite sex (15%); parental problems (14%), including divorce (6%), family quarrels (6%), and family violence (2%); death (13%) of either a relative (6%), friend (4%), or pet (3%); injury or illness (12%), including eating disorders (4%), car accidents (4%), alcohol/drug abuse (2%), or other causes; sexual abuse (9%) by family member (4%) or stranger (5%); serious thoughts of suicide (6%); public humiliation (5%), such as learning that others suspected the subject of homosexuality; and miscellaneous concerns about religion (4%) and the meaning of life (3%).

Two independent judges rated each essay for the degree to which the content was personal, using a 7-point unipolar scale on which 7 = *personal*. Interjudge correlations across essays av-

Table 1
Parameters and Responses to Essays

| Variable | Condition | |
|---------------------------|--------------------|---------------------|
| | Trauma (n = 25) | Control (n = 25) |
| Essay parameter | | |
| No. words/essay | 465.8 | 388.8 |
| No. self-references/essay | 46.8 | 30.2 |
| No. emotion words/essay | 11.7 | 0.6 |
| Personal rating | 4.69 | 1.08 |
| Self-report essay rating | | |
| Personal | 5.87 | 2.14 |
| Revealing of emotions | 5.18 | 1.34 |
| Previously held back | 4.58 | 1.52 |
| Response to essay | | |
| Physical symptoms | | |
| Before writing | 12.3 | 12.2 |
| After writing | 15.4 | 11.4 |
| Negative moods | | |
| Before writing | 13.4 | 13.1 |
| After writing | 17.8 | 11.4 |

Note. Means for the two groups were all significantly different ($p \leq .01$) except for ratings of symptoms and moods before writing.

eraged .89. In addition, objective parameters of each essay were tabulated, including the total number of words, number of self-references (I, me, my, mine), and number of emotion words. An overall multivariate analysis of variance (MANOVA) was initially computed on the objective and self-ratings of the essays. As expected, a highly significant condition effect was obtained, $F(9, 40) = 72.31, p < .01$. As can be seen in Table 1, simple one-way analyses of variance (ANOVAs) indicated that trauma subjects' essays were rated as more personal than those of control subjects, $F(1, 48) = 215.94, p < .01$. Finally, relative to control subjects, trauma subjects wrote more words and included more self-references and more emotion words (all p s $\leq .01$) on each essay.

After completing each writing session, subjects rated how personal they considered their essay to be, the degree to which they revealed emotions in their essay, and the degree to which they had previously held back telling others about the subject covered in their essay. Subjects rated each question along a 7-point unipolar scale on which 7 = *a great deal*. Averaging across the 4 days of writing, subjects in the trauma group considered their essays to be far more personal, $F(1, 48) = 279.89, p < .01$, and revealing of their emotions, $F(1, 48) = 266.73, p < .01$, than those in the control group. As depicted in Table 1, subjects in the trauma group wrote about topics that they had previously held back from telling others relative to those in the control group, $F(1, 48) = 73.80, p < .01$.

Each day, immediately before and after writing, subjects completed a brief questionnaire assessing the degree to which they felt each of eight common physical symptoms (e.g., headache, pounding heart, tense muscles) and six negative moods (e.g., frustrated, guilty, depressed). The self-report items were

summed to yield separate physical symptom and mood scales. The two scales were subjected to separate $2 \times 2 \times 4$ (Condition \times Time [before vs. after writing] \times Day) repeated-measures ANOVAs. Contrary to a simplistic catharsis or venting view, subjects in the trauma group reported higher levels of physical symptoms and negative moods following the writing compared with the control subjects. Significant Condition \times Time interactions emerged for both symptoms, $F(1, 48) = 37.21, p < .001$, and negative moods, $F(1, 48) = 61.27, p < .001$. Although significant main effects for condition and time for the negative moods were obtained (both $ps < .01$), these effects were attributable to the interaction. No other effects attained significance.

Long-Term Effects of Essay Writing

Four types of data assessed the long-term effects of disclosing traumatic experiences: mitogen responses, health center visits, self-reports of subjective distress, and autonomic changes. The immune, subjective distress, and autonomic data were collected the day before the experiment began (and before assignment to condition was made), approximately 1 hr after the final writing sample was collected, and 6 weeks after the conclusion of the writing portion of the study.

Immunological data. The blastogenic data for PHA and ConA stimulation were analyzed separately. A $2 \times 3 \times 3$ (Condition \times Day \times Concentration [of mitogen; 5, 10, and 20 $\mu\text{g}/\text{ml}$]) repeated-measures ANOVA was computed on the PHA data. Significant effects emerged for day, $F(2, 80) = 79.10, p < .001$, concentration, $F(2, 80) = 29.94, p < .001$, and Concentration \times Day interaction, $F(4, 160) = 5.25, p = .001$. Most important, however, was the emergence of the Condition \times Day interaction, $F(2, 80) = 3.36, p = .04$, indicating that trauma subjects demonstrated an overall higher mitogen response following baseline in comparison with control subjects.

The writing phase of the experiment took place during the first week of February immediately prior to midterm exams. According to annual health center records, this period is marked by one of the highest illness rates of the entire school year. The follow-up blood draw, 6 weeks later, took place 4 days before the school's spring break vacation, a time when the incidence of illness visits is much lower. In short, the highly significant increase in immune response for the follow-up period may reflect, in part, both normal seasonal variation and normal fluctuations in the mitogen stimulation assays.

The ConA data, which were only available from the first two blood draws (due to a problem with the ConA preparation), were subjected to a $2 \times 2 \times 3$ (Condition \times Day \times Concentration [mitogen stimulation level]) ANOVA. As with the PHA findings, significant day, concentration, and Day \times Concentration effects emerged (all $ps \leq .01$). Although it occurred in the same direction as the PHA means, the Condition \times Day interaction did not attain significance, $F(1, 43) = 2.03, p = .16$. No other effects approached significance.

Health center data. The number of health center visits for illness were tabulated by the student health center over two time periods: from the beginning of the school year until the beginning of the study (covering a 4-month interval) and from the beginning of the study until the debriefing period (a 6-week in-

Table 2

Mean Lymphocyte Response to PHA Stimulation Over Sample Points in Counts per Minute, Log_{10}

| Group | 5 $\mu\text{g}/\text{culture}$ | 10 $\mu\text{g}/\text{culture}$ | 20 $\mu\text{g}/\text{culture}$ |
|----------------------|--------------------------------|---------------------------------|---------------------------------|
| Trauma ($n = 20$) | | | |
| Before writing | 4.93 | 4.99 | 4.90 |
| After writing | 4.96 | 5.00 | 4.94 |
| 6-week follow-up | 5.43 | 5.42 | 5.34 |
| Control ($n = 22$) | | | |
| Before writing | 5.01 | 5.07 | 4.97 |
| After writing | 4.82 | 4.88 | 4.81 |
| 6-week follow-up | 5.37 | 5.39 | 5.30 |

Note. PHA = phytohemagglutinin. Higher numbers reflect greater lymphocyte response. The writing period took place during the first week of February. Average standard deviation within mitogen concentration levels was .260 for the trauma group and .262 for the control group.

terval). The number of health center visits was adjusted to reflect visits per month and was subjected to a 2×2 (Condition \times Time) ANOVA.

Consistent with the Pennebaker and Beall (1986) findings, a significant Condition \times Time interaction emerged for health center visits for illness, $F(1, 48) = 4.20, p < .05$. As depicted in Figure 1, trauma subjects evidenced a drop in visits relative to control subjects. No other effects attained significance. As with the immune data, it is important to note that the apparent increase in illness visits for the control group probably reflects normal seasonal illness rates during the month of February.

Subjective distress. Questionnaires pertaining to the effects of the experiment were completed 1 hr after the last writing session, 6 weeks later prior to the final blood draw, and again at the end of the semester approximately 3 months after the writing phase of the study. Two general types of information were included on the questionnaires. The first included subjects' general attitudes about the experiment. The second focused on the health-related behaviors that had changed since the experiment.

Although the experiment was associated initially with some negative feelings among the trauma subjects, they were significantly happier than control subjects at the 3-month follow-up, $t(42) = 2.09, p < .05$. In response to the question, "Looking back on this experiment, to what degree has this experiment been valuable or meaningful for you?" trauma subjects were far more positive than control subjects, $t(42) = 4.50, p < .001$ (on a 7-point scale on which 7 = a great deal, trauma mean = 4.35, control mean = 2.33). Whereas subjects in the trauma group reported feeling more depressed than control subjects on the last day of writing, $t(48) = 2.81, p < .01$ (trauma mean = 3.80, control mean = 2.68), this difference disappeared by the follow-up questionnaire, $t = .09$ (trauma mean = 2.70, control mean = 2.67). No other simple effects attained significance.

A series of repeated-measures ANOVAs were computed on questions assessing the following health-related behaviors: cigarettes smoked per day, caffeinated and alcoholic beverages consumed per day, aspirin and sleeping pill use, and hours of strenuous exercise per week. No significant main effects or interactions approached significance. In short, the experiment did not appear to influence long-term behavior.

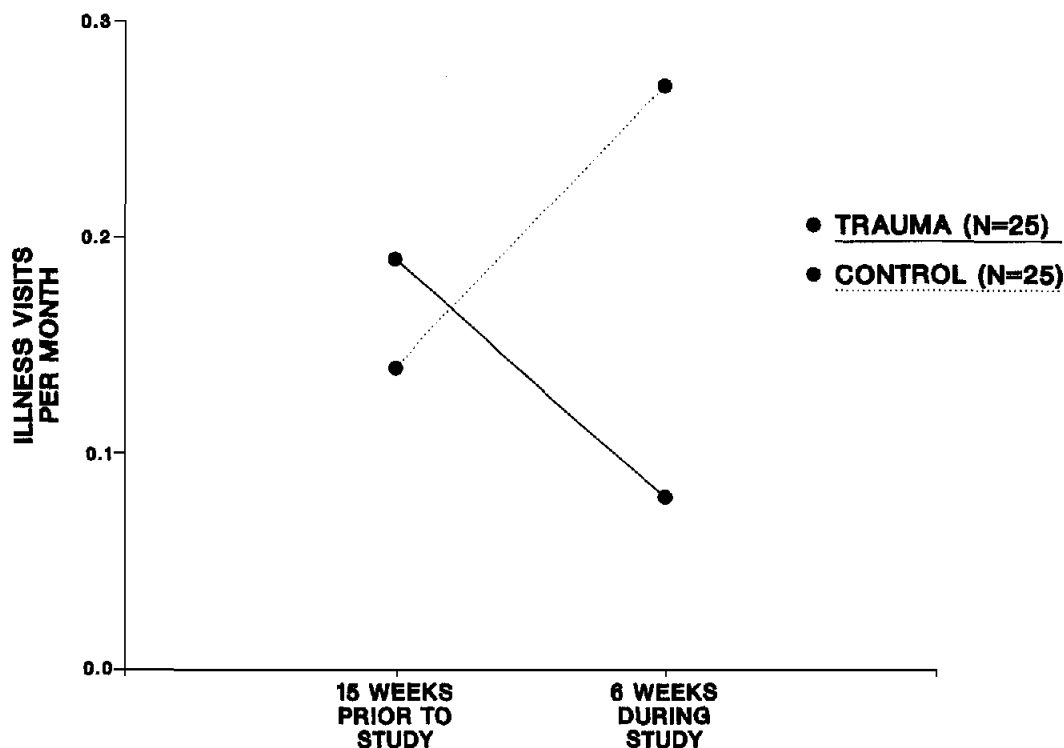


Figure 1. Mean health center illness visits for the periods before and during the experiment. (Note that the standard deviation for visits per month ranged from .12 to .40, averaging .26 over the four observations.)

Other relevant data. Resting levels of systolic and diastolic blood pressure, heart rate, and skin conductance level were measured approximately 1 hr prior to each of the three blood draws. Repeated-measures ANOVAs on each autonomic index yielded no significant effects.

Finally, simple correlations were computed between changes in immune response and changes in health center visits and autonomic levels from the first to the final day of the study. Although PHA and ConA changes over the first 5 days of the study were correlated with each other, $r(43) = .88, p < .01$, changes in PHA and ConA were unrelated to all other variables. Similarly, changes in illness visits were unrelated to autonomic levels.

Who Benefits Most: Exploring Individual Differences

Do all individuals who write about a traumatic experience benefit equally? We have argued here and elsewhere (cf. Pennebaker, Hughes, & O'Heeron, 1987) that the failure to confront traumatic experience is stressful. A significant form of stress is associated with the work of inhibiting or actively holding back the disclosure of important traumas. All participants in the present study rated the degree to which they had written about an event that they had "actively held back in discussing with others" after each writing session. According to our conception, those individuals in the trauma condition who had addressed issues that they had previously held back should have benefited most.

To test this idea, subjects in the trauma condition were split at the median into two groups based on their mean response

to the actively-holding-back question. Those who reported that they had written about topics that they had previously held back were labeled high disclosers ($n = 11$) and the remainder were labeled low disclosers ($n = 14$). A series of ANOVAs was computed on the primary variables of interest using the three groups (trauma, high discloser; trauma, low discloser; control) as the between-subjects factor. Contrasts using the mean square error term compared high versus low disclosers.

Overall, high disclosers wrote significantly more words, $t(48) = 3.53, p < .01$ (high mean = 505.3, low mean = 435.5) on each essay than low disclosers. Although high disclosers reported that their essays were more personal than low disclosers, $t(48) = 2.94, p < .05$ ($M_s = 6.13$ vs. 5.68 , respectively), independent judges rated the two groups equivalently, $t < 1.0$. No other significant essay characteristics emerged that separated high and low disclosers.

More interesting were the physiological correlates of disclosure. Analyses of the immune data indicated that, overall, high disclosers had a marginally higher response to PHA stimulation than low disclosers, $t(39) = 1.96, p = .06$ (high mean = 5.18, low mean = 5.00). An ANOVA on the ConA data, on the other hand, yielded a significant Condition \times Day \times Concentration interaction, $F(4, 84) = 2.99, p = .02$. As can be seen in Figure 2, high disclosers demonstrated an improved mitogen response across all mitogen concentrations relative to low disclosers and control subjects from before the study to the last day of writing (recall that follow-up ConA data were lost). No other interactions with the discloser variable attained significance for either PHA or ConA.

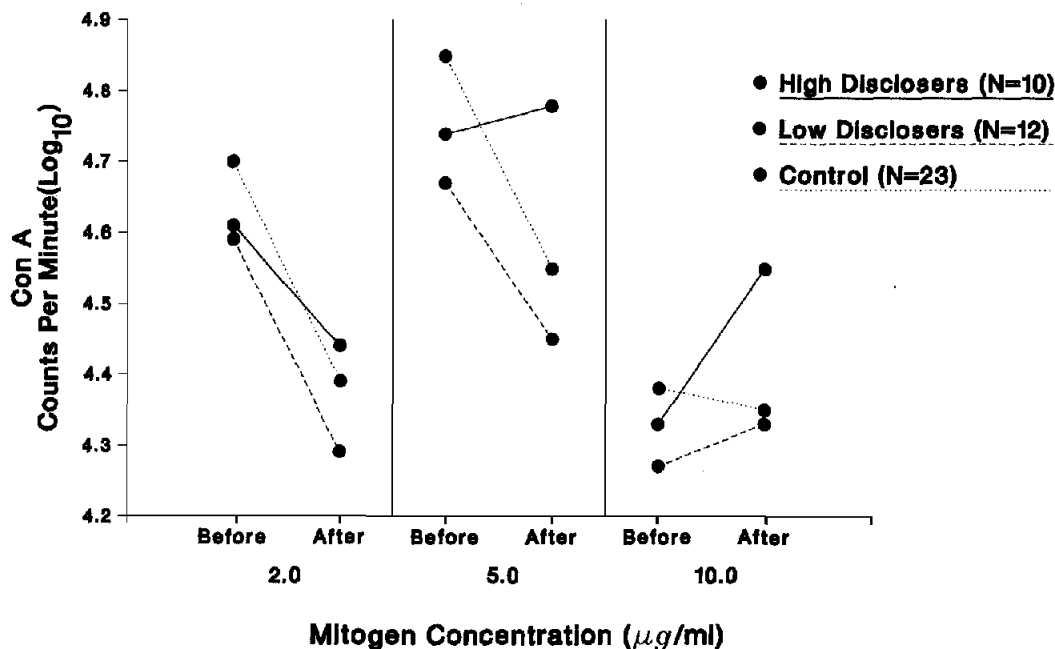


Figure 2. Lymphocyte response to three levels of concanavalin A (Con A) stimulation before and after the writing sessions.

Although there were no initial differences in autonomic levels as a function of type of discloser or condition prior to the study, repeated-measures ANOVAs yielded Condition \times Day effects for systolic blood pressure, $F(4, 84) = 2.68, p < .05$, and a marginal effect for heart rate, $F(4, 84) = 1.97, p = .10$. Indeed, from the beginning of the study to follow-up, high disclosers showed a greater decline than low disclosers in both systolic blood pressure, $t(44) = 3.42, p < .01$ (change from before study to follow-up: high disclosers = -5.5 mm/hg, low disclosers = 8.7 mm/hg), and diastolic blood pressure, $t(44) = 2.50, p < .05$ (high disclosers = -5.8 mm/hg, low disclosers = 1.0 mm/hg). Similar nonsignificant trends were found for heart rate (high disclosers = -1.2 beats per minute, low disclosers = 1.1) and skin conductance (high disclosers = -2.6 μ mhos, low disclosers = 0.3).

Discussion

The results indicate that writing about traumatic experience has positive effects on the blastogenic response of T-lymphocytes to two mitogens, on autonomic levels, on health center use, and on subjective distress. The results are important in (a) supporting an inhibitory model of psychosomatics, (b) pointing to the effectiveness of using writing as a general preventive therapy, and (c) promoting an awareness that psychotherapy can bring about direct and cost-effective improvements in health.

Within psychology, it has been generally accepted that stress can increase the incidence of illness. We have proposed that one form of stress is associated with the failure to confront traumatic experience. Specifically, the inhibition or active holding back of thoughts, emotions, or behaviors is associated with physical work that, over time, can become manifested in dis-

ease. The present study supports this idea. Individuals who are forced to confront upsetting experiences in their lives show improvements in physical health relative to control subjects. More important, in our study the individuals who showed the greatest health improvements were those who wrote about topics that they had actively held back from telling others.

One important remaining question concerns the specific dimensions of writing that actively promote health. Based on previous work (e.g., Pennebaker & O'Heeron, 1984; Wegner, in press), we believe that the failure to confront a trauma forces the person to live with it in an unresolved manner. Indeed, not disclosing a recent trauma such as the death of a spouse is associated with increased obsessions about the spouse. It follows, then, that actively confronting a trauma allows for the understanding and assimilation of that trauma.

In the present study, for example, several subjects who wrote about the same traumas day after day gradually changed their perspectives. One woman, who had been molested at the age of 9 years by a boy 3 years older, initially emphasized her feelings of embarrassment and guilt. By the third day of writing, she expressed anger at the boy who had victimized her. By the last day, she had begun to put it in perspective. On the follow-up survey 6 weeks after the experiment, she reported, "Before, when I thought about it, I'd lie to myself. . . . Now, I don't feel like I even have to think about it because I got it off my chest. I finally admitted that it happened. . . . I really know the truth and won't have to lie to myself anymore."

Clinical psychologists within the cognitive and psychodynamic traditions are currently addressing some of the processes underlying this confrontational strategy (Horowitz, 1976; Meichenbaum, 1977). Through writing or talking about an up-

setting experience, the person can come to understand the causes and effects of the trauma better, which may ultimately eliminate the need for inhibition.

Although some therapists have asserted the value of writing about one's problems, such as in bibliotherapy (cf. Lazarus, 1984), very little systematic work has been done on it. Within the context of the present study, psychologically healthy individuals were initially upset about disclosing personal and upsetting experiences. That is, immediately after writing, trauma subjects reported more physical symptoms and negative moods. Writing about traumas, then, appears to be painful in the short run. Indeed, in a recent study by Lamnin and Murray (1987) comparing a writing therapy with a client-centered approach, clients were found to be more depressed immediately after each writing session than after a live therapy session.

There are clear disadvantages as well as advantages to writing versus talking with another person about traumas. Writing about intensely personal experiences does not allow for an objective outside opinion, support from others, or objective coping information. Alternatively, writing is tremendously cost-effective, allows people to confront traumas at their own rates, and encourages them to devise their own meaning and solutions to their problems. Above all, writing may provide an alternative form of preventive therapy that can be valuable for individuals who otherwise would not enter therapy.

Previous archival studies have indicated that medical use decreases once psychotherapy begins (e.g., Mumford et al., 1981). Although encouraging, meta-analyses such as these have not been able to pinpoint the direct causal mechanisms. The present study offers experimental evidence linking the confronting of traumas with health improvement. Obviously, we have only examined the responses of a psychologically healthy population. Nevertheless, the present findings, along with those from conceptually similar experiments (e.g., Pennebaker & Beall, 1986), suggest that the disclosure of traumas is simultaneously associated with improvement in certain aspects of immune function and physical health.

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