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Journal of Personality and Social Psychology
1990, Vol. 58, No. 3, 528-537

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0022-3514/90/$00.75

Accelerating the Coping Process

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On the basis of previous work, freshmen should evidence improved health after writing about their thoughts and feelings associated with entering college. One hundred thirty subjects were assigned to write either about coming to college or about superficial topics for 20 min on 3 days. One fourth of the subjects in each group wrote during the 1st, 5th, 9th, or 14th week of classes. Physician visits for illness in the months after writing were lower for the experimental than for the control subjects. Self-reports of homesickness and anxiety were higher in the experimental group 2–3 months after writing. By year's end, experimental subjects were either superior or similar to control subjects in grade average and in positive moods. No effects emerged as a function of when people wrote, suggesting that the coping process can be accelerated. Implications for comparing insight treatments with catharsis and for distinguishing between objective and self-report indicators of distress are discussed.

There is little doubt that massive stressors can adversely affect physical and psychological health. Further, the ways by which people cope with stressors can influence their health. As more research has been conducted on the nature of coping with stressful experiences, two interrelated perspectives have emerged. The first, derived from the personality domain, argues that people use characteristic personality styles to cope with trauma. Hence, there is no "normal" or standard sequence in coping following a massive stressor. The second approach, which is congruent with much of the social and clinical literature, suggests that there are predictable changes over time in information processing and coping. The heart of this second perspective, then, assumes that people typically progress through a series of coping stages.

What makes these two approaches interesting are their logical implications for dealing with trauma. That is, can the negative psychological and physiological effects of a massive stressor be short circuited? Using the transition to college as a model of a major life stressor, we seek to compare the personality and stage approaches with our recent theory of inhibition and confrontation in accelerating the coping process.

Approaches to Coping

Major life events can affect all aspects of one's functioning, including moods, eating habits, physical health, motivation levels, social behaviors, and even views about oneself. What is unclear is whether individuals can voluntarily alter their approaches to life events and, thereby, reduce their deleterious effects. The implications of the personality, stage, and inhibition–confrontation models for accelerating the coping processes are discussed.

Personality-Based Approaches to Coping

In their most extreme form, personality-based approaches assume that different people deal with traumas in unique and unmodifiable ways. After the death of a loved one, some people do not feel depressed, whereas others do. Of those who feel depressed, many eventually return to more positive emotional states, whereas others may remain depressed indefinitely (and, indeed, may have been depressed before the death).

In an impressive review of the literature on coping and loss, Wortman and Silver (1989, in press) concluded that there are at least four stable and "normal" coping styles following irrevocable loss. On the basis of studies of people who have suffered the death of a spouse or the loss of an infant because of sudden infant death syndrome, Wortman and Silver found that approximately half of the survivors across five separate studies did not experience intense anxiety, depression, or grief after their loss. Rather, in the weeks, months, and years after the event, the affected individuals were psychologically well adjusted. Another 18% were classified as chronic grievers. That is, their distress and depression immediately following the loss continued unabated for months and years. Approximately 30% of the subjects evolved in their feelings about the loss in ways consistent with many stage approaches to coping. That is, immediately after the trauma they reported feeling depressed and distressed, but, after varying lengths of time, they reported significantly lower levels of distress and higher levels of well-being. A final group of delayed grievers—those who appeared to be well adjusted immediately after the loss but distressed at least a year later—represented only about 2% of the samples surveyed (see also Silver & Wortman, 1980).

Whereas Wortman and Silver have identified three general

This project was supported by the National Science Foundation Grant BNS8606764.

We are indebted to Suzie Ruether, Steve Barger, Sally Bunch, Nels Paine, Ginger Sproul, and Chris Freeman for their help in conducting the study. Thanks are also extended to Southern Methodist University administrators James Caswell, Mike White, Frances Campbell, and John Hall for providing archival data. Finally, we appreciate David Watson's help for his constructive feedback throughout the project and Camille Wortman's comments on an earlier draft of the article.

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reactions to loss, a number of personality researchers have begun to isolate individual differences that predict coping strategies in general. Two broad personality dimensions, negative affectivity and inhibition, appear to be consistently related to healthy or unhealthy coping. Negative affectivity, or NA, reflects a general proclivity to experience and report subjective distress (Watson & Clark, 1984). The trait of NA, which has also been called negative emotionality (Tellegen et al., 1988) and neuroticism (Costa & McRae, 1987), is highly correlated with negative moods, physical symptoms, and dissatisfaction at all times and across situations. Unlike subjects with low NAs, high-NA subjects are more introspective, less satisfied with themselves, and tend to dwell on their failures and shortcomings (see also Diener & Emmons, 1984). Although subjects with high NAs complain more than those with low NAs during and following stressful experiences, there are no clear differences between the two personality styles in terms of objective health markers, such as blood chemistry measures or mortality rates (Watson & Pennebaker, 1989).

A second dimension related to coping and health is inhibition or constraint. A number of investigations have demonstrated that individuals who use inhibitory, repressive, or denial strategies in the face of stressful experiences exhibit increased objective health problems compared with those not employing these strategies. For example, those who have had traumas and have not talked about them are more prone to a variety of illnesses (Pennebaker & O'Heeron, 1984; Pennebaker & Susman, 1988). Similarly, individuals who hold back secrets (Larson & Chastain, 1988), inhibit their personal strivings (Emmons & King, 1988), inhibit their power motivation (McClelland, 1979), or rely on repressive coping strategies (Jamner, Schwartz, & Leigh, 1988; Weinberger, Schwartz, & Davidson, 1979) visit physicians more frequently, demonstrate impaired immune function, and exhibit autonomic nervous system irregularities to a greater degree than low inhibitors.

The personality-based NA and inhibition research, along with the Wortman and Silver findings, suggests that enduring individual differences dictate how people will perceive and react to major life stressors. The recent findings from the Minnesota twin project (Tellegen et al., 1988) bolster these conclusions. Among identical twins reared apart and together, the heritability of measures of negative emotionality and constraint is remarkably high, accounting for about half of the overall variance. Taken together, the personality-based results suggest that the ways individuals cope with stressors are largely fixed and unmodifiable. In its most extreme form, then, the personality approach does not consider the idea that the coping process can be accelerated.

Stage Models of Coping

A pervasive belief in the popular literature is that individuals progress through a series of well-defined stages in coping with traumatic experiences. Perhaps the most influential of the stage theories of coping has been advanced by Kubler-Ross (1969). In interviewing individuals who had learned that they were dying from a terminal disease, Kubler-Ross reported that people often progress through five distinct stages: denial, anger, bargaining, depression, and acceptance. Variations of this model have been applied to the ways that people deal with the death of significant others, interpersonal upheavals such as divorce, and other major life transitions (Schneider, 1984).

More subtle versions of stage models of coping have been adopted by psychoanalytic and cognitive researchers as well. In studying individuals who have faced major traumas, Horowitz (1976) reported that many people progress through three general stages: denial, working through, and completion. The goal of therapy, in Horowitz's model, is to aid in the working-through phase so that completion is attained. Implicit in most of the cognitive therapies is the assumption that traumas disrupt basic beliefs or schemas. When this happens, most cognitively oriented clinicians note that individuals first experience distress that may be manifested as anxiety, depression, or denial (cf. Osterweis, Solomon, & Green, 1984). With time, individuals may reorient their lives to force new experiences into their existing schemas. Alternatively, their assumptive worlds may be changed by benevolent experiences or by direct clinical interventions (Beck, 1976; Epstein, 1984; Meichenbaum, 1977).

Both cognitive theorists and modern psychoanalysts assume a natural progression in thinking patterns following an upsetting experience. Further, initial stages of coping such as denial are viewed as ego protective. That is, immediately after a massive stressor, it is healthy to block out some of the relevant thoughts and feelings to keep anxiety levels and other stress responses within a manageable limit. Only if these defense mechanisms become maladaptive (e.g., if they are employed for too long a period) is clinical intervention suggested to alter the coping process. In short, the various stage approaches assume that individuals naturally progress from one coping strategy to another. If this normal progression is disrupted, however, various interventions such as psychotherapy can help guide the affected individuals back to appropriate coping levels. Implicit in these models, however, is that coping cannot be accelerated above "normal" or, perhaps, culturally defined limits.

The Inhibition–Confrontation Approach to Coping

Our own inhibition–confrontation model draws on both cognitive and personality perspectives by suggesting that traumas can set up a series of problems. Individuals attempt to understand and organize novel experiences. Upsetting events such as traumas are difficult to understand and assimilate because of their complex nature and, in many cases, their unexpected onset. A particularly efficient way to organize and ultimately understand events is to translate the experiences into language, which usually occurs in normal social interaction. One problem with many traumas, however, is that people either are unable or unwilling to talk to others about upsetting experiences for fear of embarrassment, disapproval, or punishment. When this occurs, people must actively inhibit their desire to talk about the significant events. Indeed, as we and others have found, a large percentage of people do not discuss major personal upheavals with others, including problems surrounding divorce, sexuality (Pennebaker & Susman, 1988), death of spouse (Pennebaker & O'Heeron, 1984), and, among homesick students, entering college or boarding school (Fisher, 1988).

In recent years, we have found that requiring individuals to translate previously inhibited traumatic experiences into lan-

guage—either through talking or writing—produces important physical and psychological effects. For example, college students who were asked to write about their most traumatic experiences for 15–20 min per day for 4 consecutive days showed enhanced immune function (Pennebaker, Kiecolt-Glaser, & Glaser, 1988) and reduced illness visits to the student health center (Pennebaker & Beall, 1986) 6 weeks to 5 months after writing, compared with students who were assigned to write about superficial topics. These and other studies suggest that confronting traumatic experiences is associated with concurrent reductions in autonomic activity, such as skin conductance and blood pressure, but also transient increases in negative moods (Pennebaker, Hughes, & O'Heeron, 1987). In other words, confronting traumatic experiences produces short-term negative costs (i.e., increases in negative affect) but longer-term benefits (i.e., improvements in health and emotional functioning).

Upsetting and novel experiences, then, are potentially unhealthy in two ways. First, the work of inhibition serves as a cumulative stressor on the body that, over time, increases the probability of disease processes (cf. Selye, 1976). Second, the failure to talk about or, in some way, translate the experiences into language impedes the natural cognitive assimilation process. Events that are not assimilated, then, will more likely remain in consciousness as unwanted thoughts (Wegner, 1989). When upsetting experiences are confronted, however, they are more likely to be understood and assimilated and the work of inhibition is reduced.

Unlike the personality and stage approaches, the inhibition–confrontation approach assumes that translating upsetting experiences into language should be beneficial for most people at any point in the coping process. Admittedly, the individuals who would maximally benefit from this procedure are those who normally inhibit talking about the traumas the most. One's tendency to inhibit disclosing a personal experience may reflect a general individual difference style or a powerful situational constraint.

A final issue relevant to the inhibition–confrontation model as well as to the present experiment concerns the role of emotional expression. In previous studies, we have found that the health benefits of confronting traumatic experience depend, in part, on individuals writing about their deepest thoughts and emotions (Pennebaker & Beall, 1986). The importance of writing about emotions could reflect one of two processes. The first, which has evolved from work on venting or modern-day views of catharsis, assumes that emotional expression serves as a release of pent-up emotional energy. Once the emotional energy is released, then, positive health effects follow (Scheff, 1979). The second and, perhaps, more likely possibility is that emotions are a fundamental part of any upsetting experience. The failure to write about emotions, then, suggests that individuals are excluding a part of the trauma that also requires understanding and assimilation. In contrast to catharsis, then, this second view holds that writing about emotions facilitates insight.

Transition to College as a Coping Paradigm

Leaving home and moving into a college dormitory around age 18 is a major upheaval for most students. The transition to college involves leaving family and friendship networks. In addition to coping with new living arrangements, most entering freshmen are changing roles within their families and within society in general. Further, most face more difficult courses and greater levels of social and academic competition than ever before. Not surprisingly, several studies indicate that the transition to college is associated with high levels of loneliness, depression, increased physical health problems, and associated difficulties (Fisher, 1988; Fisher, Murray, & Frazer, 1985). Interestingly, Fisher (1988) believes one of the biggest causes and correlates of adjusting to college is the failure of students to cognitively assimilate their new experiences. That is, rather than focusing on their current college experiences, over 60% of new students spend an inordinate amount of time thinking about their precollege lives.

In many respects, the transition to college is an ideal model for studying the coping process. Large groups of students enter a novel psychological, academic, social, and physical environment. Although there is greater day-to-day freedom in the college community compared with their secondary schools, the students must actively cope with the changes in their lives to perform well academically. From the researcher's perspective, the first year of college is an excellent laboratory because many of the major objective correlates of coping are available—health center and academic records as well as a group of subjects willing to complete self-reports.

This study sought to learn whether entering students' coping abilities could be facilitated by a confrontational writing technique. On the basis of our earlier research, we assumed that students who were required to write about their deepest thoughts and feelings related to coming to college would adjust better (and more quickly) than control subjects who wrote about superficial topics. The underlying logic, then, was that by addressing fundamental psychological problems, students would recognize and assimilate them into their evolving sense of college-student self. Two classes of hypotheses were tested:

1. In what ways does writing about coming to college alter the course of adjustment? On the basis of previous research, we predicted that psychologically confronting the college experience will result in reductions in illness rates. In the short run, those who express their deepest thoughts and feelings should report more negative feelings. Over time, however, they should report equal or superior levels of psychological and academic adjustment relative to control subjects.

2. To what degree can coping be accelerated? Because entering students either wrote about their thoughts and feelings or a control topic at one of four monthly intervals beginning with the first week of classes, several overlapping predictions can be made.

2a. According to a strict personality-based model, it would be predicted that writing about college per se should not influence the coping process directly. Alternatively, only some individuals (e.g., those high in negative affectivity or inhibitory tendencies) should benefit from writing. No clear predictions would be made about which writing time would be most beneficial.

2b. According to most stage approaches, writing about college should facilitate the working through or assimilation phase of coping. As such, it would be predicted that writing

confronting thoughts and emotions about college would be more beneficial later in the semester than when immediately beginning classes (when denial processes should still be in effect).

2c. According to the inhibition–confrontation model, confronting basic psychological issues associated with college should have positive health effects at any time. As with the personality approach, it would be predicted that those people who tend to actively inhibit talking about upsetting experiences would benefit the most from writing.

Method

Overview

A total of 130 entering first-semester college students participated in a 2 (writing condition) × 4 (wave) between-subjects design experiment. On 3 consecutive days, subjects wrote about either their deepest thoughts and feelings about coming to college or about nonemotional, superficial topics. Subjects were run in one of four waves separated at monthly intervals, with the first wave writing during their first week of college classes. In addition to self-reports of psychological and physical well-being, health center and academic records were analyzed to assess the effects of writing on illness behavior and college performance.

Subjects

The 130 (67 women and 63 men) freshmen were recruited from two large introductory psychology courses on the first day of class to participate in a study on "writing, writing skills, and the college experience." All those who agreed to participate completed a series of questionnaires and, at the end of the class period, were randomly assigned to one of four waves. Those in Wave 1 were scheduled to return to the psychology department for interviews and writing sessions later that day. An additional 18 subjects agreed to participate in the study but did not do so because of scheduling conflicts (12 subjects), withdrawal from their psychology course (4 subjects), or withdrawal from college (2 subjects).

Although 130 subjects participated in the writing phase of the study, many of them did not complete various other measures for the following reasons: (a) they dropped out of school either during the semester that the experiment was conducted (2 subjects) or by the end of the subsequent semester (4 subjects), (b) they failed to complete either the initial or first follow-up questionnaire (5 subjects), or (c) they did not mail back long-term follow-up questionnaires concerning their perceptions of the experiment (21 subjects; this represents a 79% return rate for students enrolled in the second semester) or an individual difference measure of college adjustment (an additional 35 subjects, which represents a 51% return rate) at the end of the school year. Attrition for the various measures was unrelated to condition.

Procedure

During the first day of class, all introductory psychology students completed a battery of questionnaires that included a state measure of negative affect (the scale from the Positive and Negative Affect Schedule, or PANAS; Watson, Clark, & Tellegen, 1988), the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965), and the Self-Concealment Scale (SCS), a measure of the degree to which people report keeping major secrets from others (Larson & Chastain, 1988). In addition, they were asked to sign a waiver allowing the principal investigator to obtain a summary of their health visits to the student health center. Subjects were assured orally (in the classroom) and on the consent form that the experimenter would not see the actual records and, once the study was completed, all identifying information (such as social security numbers) would be removed. Those who agreed to these conditions were given the opportunity of participating in the writing study.

Subjects were run individually at the same time on 3 consecutive days. At their appointed times, subjects met with one of two experimenters who explained the general purpose of the experiment. All subjects were told that they might be asked to write about personal and upsetting topics and that their writing samples would remain confidential. Further, it was explained that subjects were expected to write continuously on one of several possible assigned topics for 20 min each day without worrying about grammar, sentence structure, or spelling. All subjects agreed to participate. After consent forms were completed, subjects were randomly assigned to either the experimental (n = 83) or control condition (n = 47). The disparity in sample sizes was based on the decision to explore individual differences in the experimental condition.

Subjects assigned to the experimental condition were told,

> During today's session, I want you to let go and write about your very deepest thoughts and feelings about coming to college. College, as you know, is a major transition. In your writing, you might want to write about your emotions and thoughts about leaving your friends or your parents, about issues of adjusting to the various aspects of college such as roommates, classes, or thoughts about your future, or even about your feelings of who you are or what you want to become. The important thing is that you really let go and dig down to your very deepest emotions and thoughts and explore them in your writing.

These subjects were also instructed that they could write about the same or different topics during each experimental session. In fact, if they so desired, they could write about more than one topic within any given session.

Subjects in the control condition were assigned to write about specific topics for each of the three writing sessions: a description of what they had done since waking up that morning, plans for the remainder of the day, and a description of the last social event they attended. Before each day of writing, the experimenter explained the topic in the same general way. For example, the following instructions were given to subjects who were to write about what they had done since morning:

> During today's writing session, I want you to describe in detail what you have done since you woke up this morning. It is important that you describe things exactly as they occurred. Do not mention your own emotions, feelings, or opinions. Your description should be as objective as possible.

On each of the 3 writing days, all subjects first met individually with one of the two initial experimenters who reiterated the instructions and, for the control subjects, assigned the day's writing topic. Once the instructions were delivered and all questions answered, subjects were escorted to an adjacent waiting area where they were introduced to a third experimenter. The experimenter, who was blind to condition, escorted the individual subjects to one of several small experimental cubicles. The experimenter noted that subjects would be alone to write continuously on their assigned topics for 20 min. The cubicle door was then closed. Twenty minutes later the experimenter tapped on the door, asked the subjects to stop writing and, on their way out, to deposit their writing sample in a large box by the door.

When subjects had finished their writing on the last of the 3 days of the experiment, they completed a brief questionnaire that assessed their general attitudes and moods about the experiment. They were then escorted to one of two clinically experienced experimenters who conducted an in-depth debriefing session (see Pennebaker, 1989, for details). During the debriefing, the experimenters explored the subjects' perceptions and moods about the study. During the 10–30-min session, subjects were candidly told that we could not tell them what the experiment was about until the end of the semester so as not to bias the results.

Further, subjects were asked not to discuss the experiment with anyone until the end of the semester.

Subjects were run in one of four waves during the fall 1987 semester: September 1–3 (first week of classes), September 29–October 1, October 27–29, and December 1–3. During the final days of classes, December 7–8, the principal investigator met with each of the two classrooms from which subjects had been drawn. All students were asked to complete two postexperimental questionnaires dealing with their adjustment to college and, for those who had participated in the experiment, attitudes about the study. Once the questionnaires were completed, the principal investigator explained in detail the nature, predictions, and preliminary findings of the study.

Finally, in April 1988, all subjects were mailed long-term follow-up questionnaires concerning their perceptions of the experiment. Because of a mailing error, the College Adjustment Test was not included and was mailed separately 2 weeks later. Whether or not subjects completed the questionnaires, they were all mailed a final report of the experiment approximately 3 weeks later.

Dependent Measures

The dependent measures included self-reports and word usage counts about the essays themselves. Of particular importance are long-term measures of the physical and psychological effects of writing, including archival data from the health center and registrar's office and self-reports that assess adjustment to college and attitudes about the experiment. The personnel from the student health center, who were blind to condition, provided the raw number of visits to the center for illness, injury, and other reasons by date of visit. An illness visit was defined as any visit based on noninjury-relevant physical symptoms. Two or more visits for the same presenting symptom within a 1-week period were coded as a single visit because, on occasion, students would be referred from one physician to another for the same problem. Follow-up visits for health problems were included in the "other" category. The registrar's office provided college entrance examination board scores (Scholastic Aptitude Test, or SAT) and grade point averages (GPAs) for the first and second semesters. All GPA results reflect the residual GPAs after controlling for SAT scores using a multiple regression procedure.

Adjustment to college was measured using the College Adjustment Test (CAT), a 19-item survey that taps the degree to which students have experienced various thoughts and feelings about coming to college during the previous week. On the basis of two samples of 287 and 260 entering college students, the internal consistency of the scale is acceptable, Cronbach alpha = .79. Two-month test–retest with 196 introductory college students was good, $r = .65$. Factor analyses yield three stable factors that account for 46% of the variance; these reflect general negative affect about coming to college (e.g., "worried about how you will perform academically," "worried about the way you look," and "felt anxious or nervous"), positive affect or optimism (e.g., "liked your classes," "liked your social life," and "felt optimistic about your future in college"), and home sickness (e.g., "missed your friends from high school," "missed your home," and "felt lonely"). In the present study, the CAT was completed during the first and last day of classes during the semester of the experiment and again 4 months later.

Finally, subjects responded to a series of questions about the extent to which the experiment had affected their moods, the degree to which they had revealed personal and emotional aspects of themselves, and the overall value of the study. The questions, which were administered immediately after the experiment, at the end of the first semester, and again 4 months later, required subjects to respond along 7-point unipolar scales ranging from *not at all* (1) to *a great deal* (7).

Results

Overall, there were three general classes of variables associated with the writing study. The first group of factors includes the content and the subjects' self-perceptions of the essays themselves. The second class of dependent measures assesses the long-term physical and psychological effects of the writing instructions. The final cluster of measures deals with individual differences.

Characteristics of the Essays

Three independent judges checked whether each essay dealt with each of 30 different content categories (percentage agreement of category classification among raters on 15 common essays exceeded 90%). Subjects in the experimental condition wrote, on average, on 5.64 different college-related topics over the three writing sessions. Some of the most commonly addressed topics included feelings of isolation and loneliness (54% of subjects discussed this in at least one essay); loss of family (51%); loss of friends back home (45%); general worries about the future (42%); general academic concerns (41%); issues surrounding identity such as "who am I?" (39%); problems with boyfriend or girlfriend (31%); conflicts with parents (26%); feeling different from others (23%); problems with roommate (19%); conflicts surrounding religion (16%), money (11%), and sexuality (8%); and thoughts about suicide (11%).

All essays were coded for raw number of words and percentage of total words that were personal self-references, negations such as not and no, positive emotion words, negative emotion words, and markouts. The means of various word categories were subjected to 2 (condition) × 4 (wave) between-subject analyses of variance (ANOVAs). Although there were no differences in raw number of words or number of markouts, subjects in the experimental condition used more personal self-references (11.8% vs. 8.5%), $F(1, 119) = 41.6$, $p < .01$; negations (2.2% vs. 0.4%), $F(1, 119) = 196.8$, $p < .01$; positive emotion words (0.30% vs. 0.04%), $F(1, 119) = 62.5$, $p < .01$; and negative emotion words (1.0% vs. 0.2%), $F(1, 119) = 64.9$, $p < .01$, than subjects in the control condition.

After the third writing session, all subjects were asked to rate their essays along several dimensions. As would be expected, subjects in the experimental condition rated their essays as significantly more emotional (5.5 vs. 1.6, where 7 = *very emotional*), $F(1, 119) = 401.0$, $p < .01$, and personal (5.6 vs. 3.2), $F(1, 119) = 65.2$, $p < .01$, than did control subjects. No wave main effects or interactions approached significance for any essay characteristic variable.

Physical and Psychological Effects of Writing

The primary predictions of the study surround the changes in physical and psychological well-being from before to after the writing sessions. Findings from the health center records, self-reported adjustment to college, and other long-term changes are discussed separately.

Health center visits. The student health center provided the raw number of visits each student made to the health center by date for illnesses.[1] The nature of the experimental design allows

[1] The student health center also provided number of visits for injury and other reasons. As in our previous studies, no condition or wave main effect or interaction approached significance for these other types of health center visits. Therefore, these data will not be discussed further.

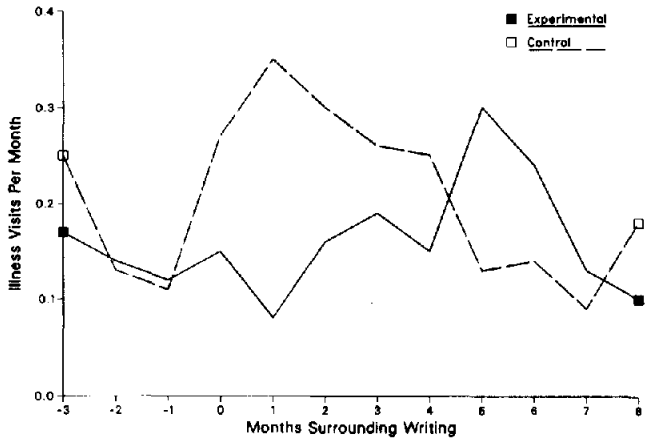

Figure 1. Illness visits per month per person as a function of condition. (Note that Month 0 refers to the month that subjects participated in the study. For Months 0–5, all 124 subjects are included. Because of the staggering of subject waves, Month −3 includes only Wave-4 subjects, Month −2 includes Waves 3 and 4, and Month −1 includes Waves 2, 3, and 4. Similarly, Month 8 is based only on Wave-1 subjects, Month 7 on Waves 1 and 2, etc.)

for at least two ways to analyze the data. A difficulty with the current design is that we did not have data on illness visits before the experimental manipulation for subjects in the first wave who wrote during the first week of classes. Similarly, Wave 4 subjects had 3 fewer months of illness data following their writing participation than those in Wave 1. To control for this, conceptually similar analyses were computed on the monthly illness data.

The first analysis, which included all subjects over the 6 psychologically comparable months of their participation, was a simple 2 (condition) × 4 (wave) × 6 (month) between–within ANOVA. That is, the ANOVA examined the month that subjects wrote (e.g., September for Wave 1 and October for Wave 2) and the 5 subsequent months. Overall, experimental subjects visited the health center less for illness after writing than control subjects, as indicated by the condition main effect, $F(1, 116) = 3.84$, $p = .05$. In addition, a significant condition-by-month interaction was obtained, indicating that the difference in illness visits for the subjects in the two conditions became smaller in the months following the writing sessions, $F(5, 580) = 2.43$, $p = .03$. No other effects attained significance.

The second analysis collapsed the mean number of illness visits into three time frames: before the experiment, the months during and following the experiment within the fall semester, and the months of the spring semester after the experiment. The problem with this strategy is that the "before" period for subjects in Wave 1 did not truly exist. To retain Wave 1 subjects, we defined their before period as the first 2 weeks of September even though, in actuality, this followed the writing session. Using this approach, the only significant effect was a condition-by-time interaction, $F(2, 232) = 3.66$, $p = .027$. Note that eliminating Wave 1 subjects yielded identical results.

Figure 1 depicts the mean illness visits by month for subjects in the two conditions. As can be seen, the probable benefit of writing disappears about 4 months after the writing session. The apparent increase in illness visits for the experimental subjects over the control subjects at the 5th month after writing did not approach statistical significance, $t(122) = -1.52$ (based on mean-square error term from overall ANOVA).

Whereas the trends for the experimental and control groups are significantly different from each other, it is important to evaluate whether or not either group deviates from college freshmen who did not participate in the experiment. The student health center provided illness visits by month for 275 randomly selected students for the same time period as the experiment. Of the 275 records, 67 were college freshmen. The sample of 67 subjects was randomly assigned a number between 1 and 4, comparable to a random wave assignment. Separate 2 (condition) × 4 (wave) × 6 (month) between–within ANOVAs comparing the random sample with both control and with experimental subjects yielded no significant effects. In short, the health center visits for the random sample fell midway between the visits for the experimental and control groups.

Psychological adjustment. Recall that the test for college adjustment, the CAT, was administered at the beginning and end of the semester and at follow-up at the end of the school year. Because of a mailing error, only 63 subjects returned the follow-up CAT, whereas all 125 subjects completed the first two administrations. To get a more complete picture of the long-term psychological effects of the experiment, we computed two sets of condition-by-wave ANOVAs on the basis of the first two administrations of the CAT (with all 125 subjects) and then on all three administrations (where $n = 63$).

A 2 (condition) × 4 (wave) × 2 (time: beginning and end of semester) between–within, repeated measures ANOVA on the overall CAT Adjustment Scale yielded marginally significant main effects for wave, $F(3, 117) = 2.58$, $p = .057$, and time, $F(1, 117) = 3.88$, $p = .051$, reflecting overall lower psychological adjustment among Wave 3 subjects and at Time 1. More important, a marginal condition-by-time interaction, $F(1, 117) = 3.62$, $p = .060$, indicated that experimental subjects *dropped* in psychological adjustment from the beginning to the end of the semester relative to control subjects, who evidenced a slight improvement.

The drop in overall CAT scores reflects changes in two of the three subscales: homesickness and general negative affect. In both cases, condition-by-time interactions attained significance, $F(1, 117) = 5.09$, $p = .026$ (for homesickness), and $F(1, 117) = 3.83$, $p = .053$ (for general negative affect). No other interactions with time approached significance. As can be seen in Table 1, experimental subjects tended to be more homesick and generally more worried about college than controls.

When these same scales are analyzed using 2 (condition) × 4 (wave) × 3 (time: beginning of semester, end of semester, follow-up) ANOVAs, all time interactions disappear. The adverse adjustment effects of writing, then, occur during the first semester and, among the long-term respondents, disappear over time.

Changes in academic and health-related behaviors. For all subjects, first- and second-semester GPAs, college credit hours attempted, and SAT scores were provided by the university administration. Using multiple regression solutions, residual GPAs for both semesters were derived using SAT scores as predictors. The residual GPAs, then, were subjected to a 2 (condition) × 4 (wave) × 2 (GPA of each semester) ANOVA controlling

Table 1
Means of College Adjustment Test Scales by Condition

Measure	Beginning	End	Follow-up
Adjustment			
Experimental	85.6	80.3	—
	(83.7)	(80.5)	(83.9)
Control	83.3	83.3	—
	(80.3)	(82.6)	(82.9)
Homesickness			
Experimental	22.9	23.0	—
	(23.6)	(22.4)	(20.8)
Control	24.8	21.8	—
	(27.8)	(23.1)	(22.1)
Negative affect			
Experimental	17.5	21.0	—
	(18.2)	(19.7)	(18.3)
Control	18.9	18.9	—
	(18.7)	(19.1)	(19.2)
Positive affect			
Experimental	30.9	28.7	—
	(30.1)	(27.5)	(28.3)
Control	30.6	28.6	—
	(29.7)	(29.0)	(28.6)

Note. The higher the number, the better the overall adjustment, the more homesick, the more negative affect, and the more the positive affect. Means outside parentheses are based on all 125 subjects; numbers in parentheses reflect means based on 63 subjects who returned the long-term follow-up questionnaire.

for credit hours attempted. Although only a trend, experimental subjects maintained their GPAs from first to second semester compared with control subjects, $F(1, 111) = 2.60$, $p = .11$ (adjusted *M*s: experimental subjects, first semester GPA = 2.78, second semester = 2.79; controls, first semester = 2.79, second semester = 2.64).

Finally, a series of questions concerning health habits, including weekly vitamin use, exercise, alcohol consumption, aspirin use, and cigarette smoking, were collected at the beginning and end of the fall semester and again at follow-up at the end of the spring semester for 98 of the subjects. Separate condition-by-wave-by-time ANOVAs on each of the variables yielded no significant interactions with time, suggesting that the manipulations did not directly affect health-related behaviors.

Long-term perceptions of the experiment. Immediately prior to debriefing at the end of the fall semester and at the end of the spring semester, students were asked to evaluate the impact of the experiment on their lives. In addition to rating the degree to which subjects had talked and thought about the study and its positive and negative impact, subjects responded to an open-ended question assessing its long-term effects.

Overall, a series of condition-by-wave by time between–within subjects ANOVAs revealed that experimental subjects had thought about what they had written in the interim significantly more than controls, $F(1, 89) = 17.39$, $p < .01$ (*M*s: experimental = 2.56, control = 1.69, where 1 = *not at all* and 7 = *a great deal*). Further, experimental subjects believed that the experiment had more positive longlasting effects, $F(1, 89) = 22.09$, $p < .01$ (*M*s: experimental = 3.24, control = 1.78), and was more valuable or meaningful for them, $F(1, 89) = 21.86$, $p < .01$ (experimental = 3.55, control = 2.18), than did controls. No condition or wave effects emerged for the degree of long-term effects (overall $M = 1.35$) or the degree to which subjects had talked to others about what they had written (grand $M = 1.55$). No wave effects or time interactions approached significance.

Particularly revealing were the open-ended responses to the question, "Now that the experiment is completed, could you tell us how it may have influenced you in the long run?" Of the 81 experimental subjects who completed the questionnaire at the end of the fall semester (immediately prior to debriefing), 71 responded to the open-ended question. Of these, only 7 (10%) discussed the value of writing in venting terms (e.g., "I purged some of my feelings" or "I had a chance to get my feelings out in the open"). The vast majority (76%) described the long-term effects by referring to their achieving insight (e.g., "It made me think things out and really realize what my problem is"; "It helped me to look at myself from the outside"; and "It was a chance to sort out my thoughts"). The remaining 14% used both venting and insight terms or terms unrelated to either approach. Interestingly, similar percentages were found among the 60 subjects who returned the long-term follow-up questionnaires at the end of the spring semester. Of the 42 subjects who addressed the reasons for the long-term influence of the experiment, 35 (83%) used insight terms, 3 (7%) used venting or catharsis language, and another 4 (11%) used a combination of insight and venting rationales.

Individual Differences

The primary reason that twice as many subjects were randomly assigned to the experimental cell as the control condition was to evaluate the degree to which individual differences might mediate changes in health as a function of writing. In a previous study, for example, Pennebaker et al. (1988) found that self-reports of prior inhibition (i.e., individuals who reported that they had written about an event that they had "actively held back from discussing with others") were associated with particularly large gains in immune function among experimental subjects. ANOVAs splitting experimental subjects on a comparable question revealed no significant differences between high and low prior inhibition on illness visits. Similarly, median splits on subjects high and low in self-esteem (using the RSE Scale), current negative and positive affect (the PANAS from Watson et al., 1988), self-concealment (the SCS from Larson & Chastain, 1988), and use of negations (McClelland, 1979) indicated that the experimental manipulation was equally effective in reducing illness visits for each individual difference group.

Finally, Table 2 depicts the simple correlations among selected individual differences and the main variables of interest for the 83 experimental subjects. Note that the illness change variable reflects the mean number of illness visits in the 4 months following the writing session minus the mean prewriting illness visits. Three effects are of particular interest. First, no significant correlations were obtained with the self-report of emotional expression of essays, use of negative emotion words in the essays, and long-term health changes. Second, the more total illness visits over the course of the year, the fewer number of illness visits after the writing sessions, $r(81) = -.25$, $p = .02$. This effect suggests that sickly people benefit more from the

Table 2
Correlations Among Selected Variables for Experimental Subjects

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Illness change	—											
2. Total illness	−.25**	—										
3. Sex	−.22**	.22**	—									
4. Negative affect	−.20*	.26**	.04	—								
5. Positive affect	−.05	.01	−.10	−.01	—							
6. College Adjustment Test—total score	−.10	−.22**	−.22**	−.42***	.18	—						
7. Rosenberg Self-Esteem Scale	.18	−.12	−.15	−.36***	.28**	.44***	—					
8. Self-Concealment Scale	.08	.02	−.11	.31***	−.06	−.36***	−.37***	—				
9. Inhibition item	−.09	.09	.10	.17	.04	−.05	−.16	.26**	—			
10. Negations	−.06	.07	.12	.05	−.11	.04	−.14	−.05	.19	—		
11. Negative emotion words	.04	.11	.11	−.02	−.09	.04	−.01	.06	.05	.12	—	
12. Emotional	−.07	.28**	−.11	.13	.23**	−.21*	−.08	.09	.13	−.08	−.08	—

Note. Illness change refers to the difference in mean illness visits in the 4 months after the experiment minus mean illness visits prior to the study. The total illness score is the sum of all illness visits over the entire semester. Sex is scored 1 = male, 2 = female. Negative affect and positive affect are derived from Watson, Clark, & Tellegen's (1988) PANAS. The College Adjustment Test general scale measures overall adjustment. The Inhibition item is based on the self-report asking subjects the degree to which they wrote about issues that they had previously held back from telling others. Negations are the percentage of *no* and *not* words in the essays; Negative emotion words are the percentage of negative emotion words in the essays. Emotional refers to self-report of how emotional the person's own essays were. Correlations are based on 74–84 subjects, depending on the measure. All correlations are Pearson *r*s, two-tailed tests.
* = $p \leq .10$. ** = $p \leq .05$. *** = $p < .01$.

writing than do generally healthy individuals and a possible "floor effect" for healthy people who rarely go to the health center in any case. Third, female students showed a greater reduction in illness visits after writing than did male students, $r(81) = -.22$, $p < .05$. Again, this reflects a baseline problem in that female students went to the health center much more before the writing sessions ($M = .31$ visits per month) than did male students ($M = .05$ visits per month). Female and male students in the experimental condition visited the health center at a rate of only 0.08 visits per month in the 4 months after writing.

Discussion

The results of the experiment demonstrate that the mere act of writing about basic thoughts and feelings about coming to college reduces the number of health center illness visits for college freshmen over the following 4–5 months relative to students who write about superficial topics. Equally important, the lack of any meaningful wave effects indicates that whenever individuals confront their thoughts and feelings about college, positive health effects follow. That is, writing about significant feelings during the first week of coping with college brings about comparable perceptions, feelings, and health changes, as does writing about the same topic during the fourth month of college. These findings have important implications for the understanding of coping processes, the links between self-report and objective health and adjustment measures, and the role of insight versus catharsis in healing.

By and large, the results are not supportive of strict versions of either a personality-based or a stage model of coping. The analyses indicated that, as a group, the experimental subjects in all four waves benefited equivalently from writing. Further, individual difference measures that tapped negative and positive affect, inhibition, and self-esteem were unrelated to changes in physical or psychological health as a function of condition. Note that the failure to find individual differences as a function of manipulation does not necessarily undermine the personality-based approach. Recall that this approach has focused on how individuals naturally cope with traumatic experiences. In this study, the manipulation may have simply swamped the effects of the individual differences that we examined.

It is of interest that we failed to find differences as a function of the question concerning prior inhibition. This apparent failure to replicate the internal analysis of Pennebaker et al. (1988) may help to identify the relative power of processes related to inhibition versus confrontation. In previous studies, we have asked subjects to write or talk about the most traumatic experiences of their entire lives. As a rule, the experiences that they confronted had occurred several years earlier. In the present experiment, subjects were just beginning to inhibit their transition-to-college experiences. In other words, the long-term deleterious effects of inhibition may not have had time to influence health. Interestingly, then, the value of writing about thoughts and feelings in the experiment may have simply been to assimilate their leaving home with current college experiences. Assimilation rather than reduction in inhibition may have been the key variable that promoted health.

That no wave effects emerged is potentially damaging to a strict stage model of coping. A stage model would have predicted that writing about college during the first week of classes could have challenged a variety of psychological defenses when they were most needed. If this had been the case, the first wave of subjects either would not have improved (because their defenses remained intact) or would have exhibited especially high levels of anxiety. It should be noted that the failure to find any wave effects could reflect the fact that students are under comparable amounts of stress during their entire first semester. Alterna-

tively, transition to college may be a poor model for studying coping in comparison to learning of the death of a spouse or one's own catastrophic illness. Finally, as with the personality-based approach, we cannot dismiss the stage approach as it may occur in the natural environment. We have merely demonstrated that a writing intervention can potentially overpower naturally occurring stages of coping.

A comparison of the stage approach and the inhibition–confrontation model indicates that they focus on somewhat different end points. Whereas many people who examine coping are primarily concerned with psychological adjustment to coping, others focus more heavily on objective health markers. Indeed, it is critical to distinguish between measures of subjective distress and more objective indicators of distress. Recently, researchers have demonstrated that across a large number of studies, self-reports of unhappiness, distress, job dissatisfaction, general well-being, and related measures are virtually uncorrelated with overt behaviors and physiological indicators of stress (Costa & McRae, 1987; Watson & Pennebaker, 1989). Complaints, such as those measured with our CAT, reflect to a large degree the pervasive negative affectivity trait (i.e., general individual differences in subjective distress). Our measure of illness behaviors, on the other hand, reflects actual illnesses, proclivity to use medical services, and processes associated with symptom perception. Measures of illness and subjective distress, then, can reflect different processes.

The present experiment, as well as others that we have conducted, found that writing about the transition to college resulted in more negative moods and poorer psychological adjustment by the end of the first semester. Our experiment may have effectively stripped the normal defenses away from the experimental subjects. With lowered defenses, our subjects were forced to deal with many of their basic conflicts and fears about leaving home, changing roles, and entering college. Our control subjects, on the other hand, survived the first semester with their defenses intact at the expense of their health and, to a marginal extent, their GPA. If this analysis is correct, the cost of effective coping during stress may be poorer health. Alternatively, if physical health is the definition of effective coping, psychological well-being may temporarily suffer.

Another issue of interest concerns the nature of catharsis and insight. All indications from the study suggest that the power of confronting upsetting experiences reflects insight rather than cathartic processes. In follow-up questionnaires, for example, the overwhelming majority of subjects spontaneously wrote that the value of the experimental condition derived from their achieving a better understanding of their own thoughts, behaviors, and moods. Similarly, subjects' ratings of how emotional their essays had been—as well as the percentage of emotional words used in the essays—were uncorrelated with change in illness visits after the experiment. A simple venting or catharsis view would predict that the more that people expressed emotion, the healthier they would be. The insight perspective, however, would simply require that the person be aware of his or her emotions—but not in a linear way.

Finally, the results of the experiment have practical applications for individuals who are trying to cope with upsetting experiences. As we have now found in three separate large-scale studies, writing about traumas or other stressors has positive physical and long-term psychological benefits. As a form of preventive psychotherapy, then, the writing technique is simple, inexpensive, and free of potentially negative social feedback.

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Received December 20, 1988
Revision received July 6, 1989
Accepted July 26, 1989 ■