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CONFESSION, INHIBITION, AND DISEASE

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I. Introduction

The pain I was feeling was something I have never felt before in my life. I never actually thought that *my* Julie would be leaving me. It was like someone taking my heart and squeezing out all of the feelings I have for her. Why is this happening to me? Everything was so perfect for us. We had everything in the world together. Our love was unbreakable. (18-year-old freshman on the break-up of a relationship.)

I love my parents. We have a perfect family life. My parents always support me in whatever I do. . . . My father has been such a bastard. I know that he has something going with his secretary. My mother takes it out on me. I have to wear the clothes she wants, date the boys she wants. I'm even at SMU because she went here, even though I wanted to go to UT. (20-year-old college junior.)

There was a burst of gunfire and my buddy fell to the ground, half of his head blown off. I looked up and a Gook was running into a shed carrying a machine gun. I ran to the shed, jumped through the door and fired, hitting them in both legs. It was a woman who had shot my buddy and who was bleeding on the ground. We started into each other's eyes. I ripped off her clothes and made love to her. Before I knew it, I could hear choppers overhead—ours. I pulled out my knife and slit her throat. I loved her. I killed her. (33-year-old Vietnam veteran.)

Today, my mother sent me a care package and I was very excited until I opened it. It was all old things that I had left in my room, bills, old letters, etc. I began to realize that my past could follow me anywhere. My mother sent me an old book I used to have on commonly misspelled words. It almost offended me. That was such a reminder of all the old habits and immature actions I felt like a child again [sic]. (18-year-old college freshman.)

They were throwing babies from the second floor window of the orphanage. I can still see the pools of blood, the screams, and the thuds of their bodies. I just stood there afraid to move. The Nazi soldiers faced us, with their grimaces. (68-year-old concentration camp survivor, recounting the last days of the Lodz Ghetto, 1942.)

These excerpted transcripts come from individuals who have participated in our studies dealing with traumatic experiences. When given the opportunity, people readily divulge their deepest and darkest secrets. Even though people report that they have lived with these thoughts and feelings virtually every day, most note that they have actively held back from telling others about these fundamental parts of themselves. Indeed, these people report that they have never before discussed these feelings and events with anyone.

This article explores the nature of confession and inhibition. Over the past several years, my colleagues and I have learned that confronting traumatic experiences can have meaningful physiological and psychological benefits. Conversely, not confiding significant experiences is associated with increased disease rates, ruminations, and other difficulties. This pattern of findings has helped us in developing a useful theory of active inhibition that shares many of the assumptions of learning theory, psychodynamic models, and more recent cognitive perspectives.

The article is divided into four general sections. The first section examines the nature of confession *per se*. When given the opportunity, what secrets do people divulge? Why and how do they do it? The second section focuses on the physiological and psychological effects of confronting (or actively avoiding) past traumatic experiences. Based on a number of laboratory and field studies, it is clear that requiring people to write or talk about traumas is associated with both immediate and long-term health benefits. Using the first two sections as a base, the third section presents a formal theory of active inhibition. The links between the theory and Freud, animal learning, and cognitive perspectives are discussed. The final section of the article is devoted to a reexamination of catharsis, the development and breakdown of the self, and the role of psychosomatics in social psychology.

II. The Parameters of Trauma and Confession

BACKGROUND

There is little doubt that traumatic experiences are physically and psychologically unhealthy. The early work of Selye (1976) pointed to the biological effects of psychological traumas on rats and humans. Numerous studies that have examined major life events in general (e.g., Holmes & Rahe, 1967), or specific life events such as rape, war, or natural disaster, repeatedly demonstrate their

negative effects on physical and psychological health (for reviews, see Figley & McCubbin, 1984; Sowder, 1985; VandenBos & Bryant, 1987).

In recent years, a number of researchers have suggested that social, cognitive, and individual difference factors can buffer the deleterious effects of life events. For example, friends and acquaintances (e.g., Cobb, 1976), intimate relationships (e.g., Hatfield, 1982), and other forms of social support have been shown to reduce stress in a number of ways (Cohen & McKay, 1984). The stability of individuals' views of themselves (Brown, 1988; Swann, 1987), their ability to find meaning in the events (Janoff-Bulman, 1985; Silver, Boon, & Stones, 1983), and other techniques influencing cognitive appraisal can blunt or exaggerate the stress response (Lazarus & Folkman, 1984). Finally, certain individual differences, such as hardness (Kobasa, 1982), self-complexity (Linville, 1987), low levels of psychic conflict (Emmons & King, 1988), and optimism (Scheier & Carver, 1985) have been found to reduce the physiological effects of massive life stressors.

An important dimension to coping with stressors that may underlie many of these approaches concerns the degree to which people discuss or psychologically confront traumas after their occurrence. Jourard (1971), for example, argued that self-disclosure of upsetting experiences serves as a basic human motive (see also Derlega, 1984). As such, most people naturally discuss daily and significant experiences with others. Even major traumas such as the death of a friend, a shared natural disaster, or a house fire are usually discussed in detail with close friends. Less socially acceptable traumas, however, can be far more difficult to confide: marital infidelity, embezzlement, being the perpetrator or victim of rape. Whereas talking about a trauma with others can strengthen social bonds, provide coping information and emotional support, and hasten an understanding of the event, the inability to talk with others can be unhealthy for a number of reasons that are discussed herein later.

Across several correlational studies, we have consistently found that not confiding any type of traumatic event is associated with illness episodes and measures of subjective distress. For example, among individuals whose spouses have died unexpectedly by suicide or automobile accident, the more the survivors have talked with others about their spouse's death, the healthier they report being and the less they ruminate about their spouse a year after the death (Pennebaker & O'Heeron, 1984). Among a sample of 200 white-collar workers in a large corporation, we found that experiencing any type of trauma in childhood that was not discussed with others was correlated with current diagnosed health problems, ranging from hypertension and cancer to bouts of influenza and diarrhea (Pennebaker & Susman, 1988). As can be seen in Fig. 1, comparable findings have emerged among college student samples (Pennebaker, Colder, & Sharp, 1988a; Pennebaker & Hoover, 1985). In all of these studies, the magnitude of the confiding-illness relationship was either unaffected or became stronger when measures of social support (e.g., number of close friends) were statistically controlled.

These preliminary findings, then, strongly implicate the beneficial role of

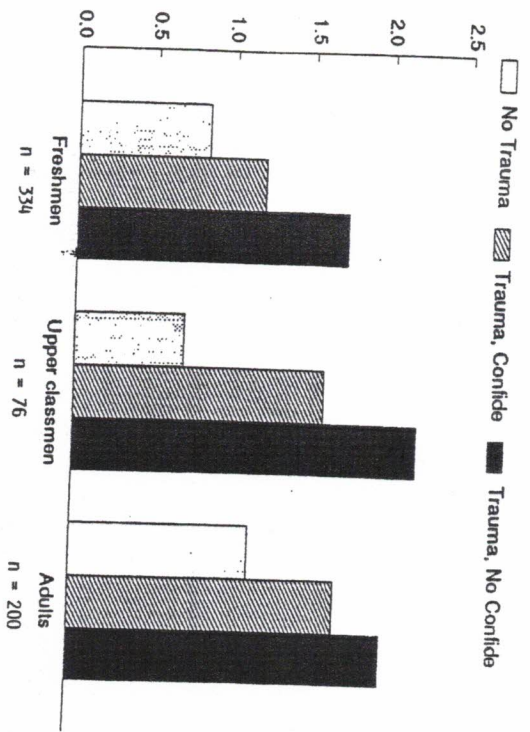


Fig. 1. Illness measures among subjects who reported experiencing no traumatic experiences, traumatic experiences that were all confided, or traumas that were not confided. In the freshman sample, the y-axis refers to actual number of health center visits in the 4 months following completion of the trauma questionnaire. For the upperclass student sample, the y-axis refers to number of self-reported visits to a physician in the 6 months preceding the completion of the trauma questionnaire. The y-axis for the adult sample reflects number of self-reported major and minor illnesses in the previous year.

liking about traumatic experiences and, conversely, the danger of not confiding. An obvious difficulty in evaluating correlational studies such as these is that they are necessarily confounded with social support, cognitive style, or individual differences. In order to remedy this, we have conducted a number of laboratory experiments wherein disclosing traumatic or upsetting experiences is manipulated.

INDUCED CONFESSION IN THE LABORATORY: THE GENERAL PARADIGM

Since 1984, we have run several types of studies that require individuals either write or to talk about their most upsetting personal experiences and, when possible, topics that they have not discussed with others. Some of the studies require students to disclose traumatic experiences on a single occasion while others examine the nervous system or brain wave activities are monitored. Other experiments, which examine long-term health or immune system function, require individuals to write about traumatic experiences for 15 to 20 minutes each day for 3 or 4 consecutive days. This section first outlines our subject selection pro-

cedures and general disclosure instructions. It concludes with a discussion of the ethics and safeguards of conducting studies such as these.

1. Subject Recruitment

Most of the studies that are discussed in this section have used psychology students who receive extra credit for their participation. Typically, the senior investigator addresses the eligible classes and notes that participants may be required to write or talk about the most traumatic experiences of their entire lives. Prospective subjects are assured that their disclosures will be anonymous and confidential. To participate in the experiment, subjects later sign up for the experiment on a form that includes a warning: "NOTE—In this study, you may be expected to write (or talk) about deeply personal experiences."

The night before the actual study, subjects are telephoned and again told that the study may involve their writing (or talking) about extremely upsetting experiences. Further, they are warned that the study may make them cry or feel depressed. They are strongly encouraged not to participate in the study if they have any qualms. Despite these repeated warnings and the availability of other, less-threatening studies, over 90% of the subjects appear for the experiment on the following day. It should be noted that the phone call also forces subjects to think about the topics that they will disclose on the following day.

Based on several questionnaires completed by all introductory psychology students, our subjects do not differ from those who do not sign up for the study in any systematic way. That is, there are no differences in gender or in scores on the Marlowe-Crowne Social Desirability Scale, the Beck Depression Inventory (BDI), symptom or health measures, or scales that tap self-esteem, positive affect, adjustment to college, and so on.

2. General Procedure

At the appointed time, subjects meet individually with an experimenter who again warns them about the study and encourages them to withdraw and receive full credit. After assurances of anonymity are made, subjects, who are randomly assigned to write (or talk) about traumas, are told:

Once you are escorted into the experimental cubicle and the door is closed, I want you to write continuously about the most upsetting or traumatic experience of your entire life. Don't worry about grammar, spelling, or sentence structure. In your writing, I want you to discuss your deepest thoughts and feelings about the experience. You can write about anything you want, but whatever you choose, it should be something that has affected you very deeply. Ideally, it should be about something you have not talked with others about in detail. It is critical, however, that you let yourself go and touch those deepest emotions and thoughts that you have.

I should warn you that many people find this study quite upsetting. Many people cry during the study and feel somewhat sad or depressed during and after it.

There are, of course, variations in these instructions, depending on the study; these are discussed later. If subjects participate in a single-session, within-subject experiment, they write/talk both about traumatic topics and about superficial topics, such as their plans for the remainder of the day, in a counterbalanced order. In the multiple-session, between-subjects studies, subjects assigned to write about traumatic experiences are free to write about the same or different traumas during each of the 3 or 4 sessions.

After receiving their writing assignment, subjects are escorted to one of several small experimental cubicles by an experimenter who is blind to condition. In the cubicles, subjects are alone for the entire writing/talking period. When the writing time is over, the experimenter returns to the room, asks the subjects to place their assigned identification code on the writing sample, and to place their essay and relevant questionnaires into a large box as they leave the writing area.

Three aspects of this procedure should be highlighted. First, great effort is made by the lead experimenter to establish rapport with each subject. In all of our studies, we have tried to convey a sense of grave importance of the research and our abiding concern for the subject. When giving the trauma instructions, we attempt to be as intense and serious as possible. Our goal, then, is to have the subjects walk into the cubicle with the belief that they are about to reveal their deepest secrets in an honest way.

Second, it is critical that the writing or talking sessions occur in a unique and isolated environment. The writing or talking area is quiet and, once subjects begin writing, the door is shut to give them the impression of solitude. As is discussed later in the article, we are convinced that the more distinct the writing situation (i.e., the more removed from the real world), the more likely people will be to express their deepest thoughts and feelings.

Third, we use every technique that we can think of in our aim to give a sense of anonymity. Subjects place their own essays into a large box with a small slit in it; no names are ever used or asked for by the experimenters; each subject is assigned a unique ID number.

3. *Debriefing and Ethical Considerations*

As is discussed in the following section, many subjects in our experiments are profoundly affected by their participation. Each debriefing session, which lasts between 20 minutes and an hour, is conducted by a clinician, a graduate student with clinical training, or the author. The general format of the sessions is based on the debriefing approach of Aronson and Carlsmith (1968). Much of the time is spent exploring how the subjects are feeling at the moment, as well as any problems they may be experiencing directly or indirectly from the experiment. In addition, all subjects are told about the various counseling services offered by the university. The ultimate goal of the debriefing at this point is to make them feel good about the study and the critical role that they have played.

In the multiple-session studies, we are particularly interested in following each subject's health center visits. Because visits could be influenced by our debriefing, we do not tell the subjects of the exact aims of the study (i.e., looking at long-term health). Nevertheless, we are honest in telling them that we cannot inform them of the exact nature of the study for fear of biasing our results. In all of these studies, however, subjects are contacted between 6 weeks and 4 months after the writing phase to evaluate how they are doing. At this time, subjects are told the exact nature of the research, what we were looking for, and what we found.

Because of the sensitive nature of this research, only the author reads each of the writing samples each night during the course of the study to be certain that no one is in imminent psychological or physical danger. Of the 300+ people that we have run using this paradigm, 2 have shown sufficient instability to warrant our excusing them from the remainder of the study and referring them to our staff clinical psychologist who serves as a consultant to the project.

C. HOW AND WHAT PEOPLE DISCLOSE

This is an extremely powerful paradigm. This section first discusses the immediate psychological impact on the subjects. It then provides an overview of the topics that subjects typically disclose and how they go about disclosing them. It concludes with a summary of individual differences related to degree of disclosure.

1. *Immediate Impact on the Subjects*

In the two experiments in which we have asked subjects to talk about traumatic experiences into a tape recorder for no more than 5 minutes during a single session (Pennebaker, Hughes, & O'Heeron, 1987), over 25% have cried. In these same experiments, when subjects were asked to rate how upsetting or stressful their disclosures had been, using a 7-point scale on which 7 is *extremely upsetting*, the mean rating has been 5.3.

Averaging across the three multiple-session, between-subjects experiments in which subjects have been asked to write about their upsetting experiences for 3 or 4 days (Pennebaker & Beall, 1986; Pennebaker et al., 1988a; Pennebaker, Kiecolt-Glaser, & Glaser, 1988b), subjects in the primary trauma conditions have rated their essays as extremely personal (mean = 5.4, where 7 = *personal*) and emotional (mean = 5.3), compared to control subjects, who wrote about superficial topics (control means = 2.4 for personal and 2.3 for emotional).

Self-reports also indicate that repeated writing greatly increases general feelings of sadness and depression. After each day's writing, for example, subjects are asked to report the degree to which they are currently feeling each of several

emotions. Not surprisingly, in comparison with controls, trauma subjects reporting significantly more sad, depressed, frustrated, and guilty. Taken together, these findings would indicate that disclosing upsetting experiences is not immediately uplifting—as might be predicted from the perspective of a simple venting or emotional catharsis (e.g., Scheff, 1979).

On the last day of writing and again on follow-up questionnaires 4 months later, subjects are asked how valuable and meaningful the study has been for them as well as the likelihood that they would participate in the study again. Overall, trauma subjects rate the studies as quite valuable and meaningful (4.4, where 7 = *valuable and meaningful*) relative to controls (2.3). When asked whether they would participate again knowing what they do now, approximately 8% of the trauma subjects and 93% of the controls have answered affirmatively.

2. Topics of Disclosure

The topics that trauma subjects in the various studies have written or talked about have varied considerably. Table 1 includes a rough breakdown of categories or four of the experiments. Because many of the topics could be classified in multiple ways, the percentages for each of the studies exceed 100%. As can be seen, the majority of subjects disclose issues surrounding interpersonal conflict and intimacy and loss through death or divorce. Note also that a slightly different pattern emerges for topic of disclosure when individuals talk into a tape recorder on one occasion than when subjects write for 4 consecutive days.

The data in Table 1 fail to convey the uniqueness and power of the stories that our subjects have disclosed. The following sketches provide a flavor of the essays and transcripts from our studies:

A female who has lived in fear for several weeks because of the physical and psychological harassment of a jealous woman who has apparently hired two thugs.

A male who, in his high school years, was repeatedly beaten by his stepfather. After attempting suicide with his stepfather's gun, the stepfather further humiliated the subject by laughing at his failed attempt.

A female who, in a fit of rage at her father, accused him of marital infidelity in front of her mother. The accusation, which apparently was true and unknown to the mother, led to the separation and divorce of the parents and overwhelming guilt on the part of the daughter.

A female who, at the age of 10, was asked to clean up her room because of her grandmother, who was to visit the home later that evening. The girl did not do so. That night, the grandmother slipped on one of the girl's toys and broke her hip. The grandmother died a week later during a hip operation.

A male who, at age 9, was calmly told by his father that he was divorcing the boy's mother because their home life had been disrupted ever since the boy had been born.

Story after story reveals deceit, tragedy, and misery. The feelings of horror, fear, and rage associated with rape, incest, and family violence are featured in every study. The despair and loneliness of the death of a family member, of moving to a new town in childhood, or in coming to college are commonplace. Problems surrounding alcohol and other drug abuse by students and their parents, eating disorders, and suicidal thoughts regularly surface in each experiment.

A grim irony is that these studies have been conducted at Southern Methodist University—a school with a disproportionate number of upper-middle-class students with above-average entering Scholastic Aptitude Test (SAT) scores. That

TABLE 1
PERCENTAGE OF TOPICS DISCLOSED IN THE TRAUMA CONDITIONS ACROSS FOUR STUDIES^a

Topic	Study				
	Pennebaker & Beall (1986)	Pennebaker, Kiecolt-Glaser, & Glaser (1988b)	Pennebaker, Hughes, & O'Heeron (1987)	Study 1	Study 2
Death					
Family member	6	6	10	13	
Friend	18	4	15	10	
Pet	4	3	0	0	
Family					
Divorce—separation	3	6	15	10	
Conflict—fights	13	8	8	9	
Interpersonal conflicts	19	15	23	13	
Opposite sex	4	2	4	2	
Same sex					
Illness—accident					
Relative—friend	3	0	15	13	
Self	7	16	0	8	
Failure—humiliation	6	5	0	5	
Academic					
Coming to college	4	19	3	8	
Grades—teachers	5	3	13	13	
Sexual traumas	3	9	5	7	
Psychological—behavioral					
Eating disorders	0	4	4	0	
Alcohol—drugs	5	2	0	2	
Suicidal thoughts	3	6	0	0	
Existential	1	7	0	0	
Total codable essays or tapes	119	100	20	39	

^aThe Pennebaker & Beall and the Pennebaker, Kiecolt-Glaser, & Glaser studies required trauma subjects to write four essays. The two experiments of the Pennebaker, Hughes, & O'Heeron study involved subjects talking into a tape recorder for 3 to 5 minutes during a single session. Percentages for each study exceed 100% due to multiple coding of some topics.

so many of these students are currently living with significant traumas hints at an even higher rate of problems among individuals in the population at large.

3. The Ways People Disclose Traumas

When we began this research, one of the more startling discoveries was how individuals disclosed traumas. Whether writing or talking, when subjects begin addressing the most intimate aspects of their lives their mode of presentation changes. Across the various studies, individuals in the trauma conditions talk faster, write more words per essay, and use more first-person pronouns than those in the control conditions.

Subjectively, most people who talk or write about traumas appear to enter a different level of consciousness during the study. In the studies in which subjects talked into a tape recorder about both traumas and their plans for the day (Pennebaker et al., 1987), we were struck by how subjects' voice qualities changed as a function of topic. Often, as subjects began to disclose the most intimate aspects of their traumas, they began to whisper and to accelerate their speech dramatically. In many cases, their voice characteristics were so different (e.g., tone, volume, even accent) from their normal ways of speaking that they sounded as though they were different people.

In our writing studies, we frequently find that people change their handwriting style when writing about different topics even within the same essay. It is not uncommon for subjects to switch from cursive writing to block lettering for a given topic and then return to the original writing style after completing a particularly significant topic. Some examples of changes in lettering, which are included in Fig. 2, include differences in the slanting of letters, pen pressure, and markouts.

We believe that these changes in presentation style reflect the psychological state that accompanies a "letting-go" or disinhibition. When the normal social or cognitive constraints of disclosing personal experiences are lifted, a different aspect of the self emerges. This change may be similar to the trance states discussed by Erickson, Rossi, and Rossi (1976), or Csikszentmihalyi's (1975) flow experience. We should emphasize that not all of our subjects demonstrate these pronounced presentational changes during the studies. They are, however, far more likely to occur among subjects who rate themselves (or are rated by judges) as disclosing deeply personal topics that they have not discussed with others before the study.

4. Individual Differences

As just suggested, there are large individual differences in the ways and the degree to which that people disclose traumatic experiences. As with any long-term research project, our approach to an individual difference measure of dis-

closure has gradually changed. In the first of several studies that have examined correlates of degree of disclosure, three independent judges rated each tape recording of 39 subjects who disclosed traumatic experiences, as to the degree to which the recording was personal and emotional (Pennebaker et al., 1987, Study 2). These ratings were summed, yielding a degree-of-disclosure score. The disclosure score was then correlated with a number of individual difference measures that had been completed prior to the study.

Overall, degree of disclosure was positively (and significantly) correlated with the Cognitive and Somatic Anxiety Questionnaire (CSAQ from Schwartz, Davidson, & Goleman, 1978), the Maudsley measure of obsession and compulsion (Rachman & Hodgson, 1980), and the MMPI Psychasthenia scale. Disclosure was unrelated to the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1964) and to gender. This pattern of results indicates that individuals characterized as high in negative affectivity, or NA (Watson & Clark, 1984), are more likely to disclose deeply personal aspects of themselves within a brief 5-minute disclosure period.

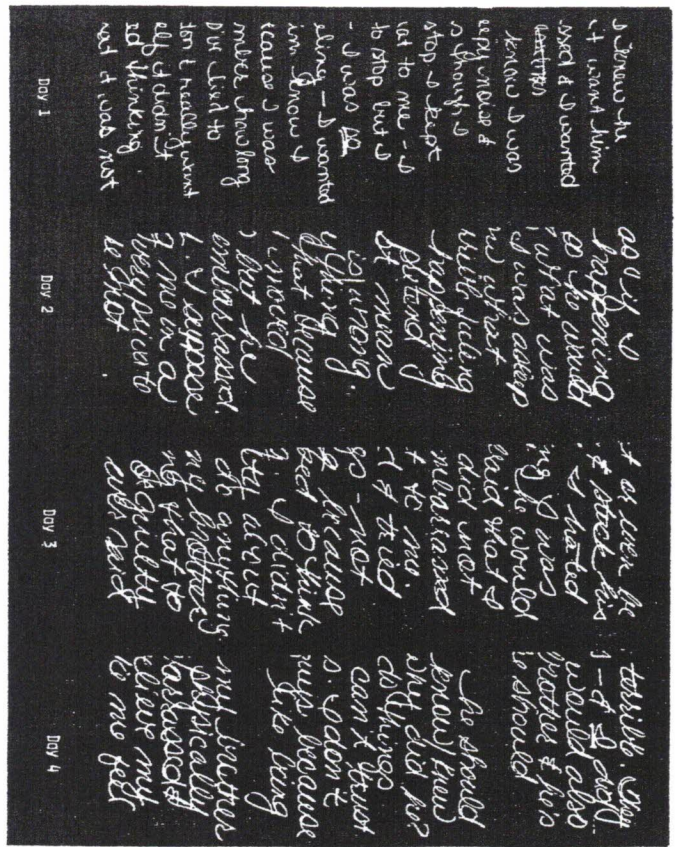


Fig. 2. Change in handwriting of a female describing the same episode over the 4 days of writing (from Pennebaker et al., 1988b).

More recently, we have changed our focus to consider the degree to which individuals disclose issues that they have previously held back in telling others. In other words, we are more interested in the subjective state of disinhibition than in disclosure per se. In one study (e.g., Pennebaker *et al.*, 1988b), we required 25 subjects to write about their deepest traumas for 4 consecutive days. After each writing session, subjects rated the degree to which they wrote about things that they had previously held back from telling others. Unlike judges' ratings of degree of disclosure, writing about previously inhibited topics was inconsistently related to the CSAQ, and negatively correlated with the Marlowe-Crowne.

Finally, as is discussed in greater detail below, we have recently moved to a physiologically based measure of disinhibition or degree of disclosure. Based on earlier studies, we have consistently found that individuals who are objectively rated as high disclosers also have low skin conductance levels (SCLs) during the time they confront traumas relative to times that they talk or write about superficial topics. Degree of disinhibition-disclosure, then, can also be defined by the difference in SCL between confronting traumatic versus trivial topics. In a recent study of 24 subjects (Pennebaker & Sharp, 1988), this difference score was uncorrelated with the Taylor Manifest Anxiety Scale, the Marlowe-Crowne, and gender.

III. Confession: Its Effects on Mind and Body

The general laboratory paradigm that we have used is clearly powerful in eliciting stories of previously undisclosed experiences. Indeed, a brief reading of the technique might suggest that forcing people to dredge up unpleasant experiences could have negative physical and psychological effects. Our studies provide overwhelming evidence to the contrary. In this section, we examine three classes of experiments that deal with the effects and correlates of confronting traumatic experience on long-term health and immune function, autonomic activity, and brain wave activity.

A. LONG-TERM HEALTH AND IMMUNE FUNCTION

Our first question concerning the impact of disclosing traumatic experiences on physical health evolved from a series of survey studies. For example, in a survey of 200 employees of a large corporation, we found that individuals who had experienced traumatic experiences in childhood *and* who had not concealed these traumas to others were significantly more likely to have contracted cancer, hypertension, ulcers, and even major bouts with influenza than were peo-

ple either who had not had traumas or who had confided them (Pennebaker & Susman, 1988). These effects held when controlling for social support, age, and recent traumatic experiences. Similarly, in a survey of 19 individuals who had suffered the death of their spouse due to an automobile accident or suicide, a comparable pattern obtained (Pennebaker & O'Heeron, 1984). That is, those individuals who had talked with others about their spouses' death were significantly healthier in the year following the death than those who had not talked with others.

Based on these and other surveys (e.g., Pennebaker & Hoover, 1985), we sought to manipulate experimentally disclosure among a normal college population in order to learn what aspects of disclosing traumatic events could influence long-term health. In the study (Pennebaker & Beall, 1986), 46 healthy undergraduates were asked to write either about the most traumatic and stressful experiences of their lives or about trivial assigned topics for 4 consecutive days. Of those assigned to write about traumatic events, one experimental group wrote about the facts surrounding the traumas but not their feelings about the traumas (trauma-factual condition), another about their feelings concerning the traumas but not the facts (trauma-emotion), and a third about both their feelings and the facts concerning the traumas (trauma-combination group). Across the four experimental sessions, subjects in the trauma-emotion and the trauma-combination conditions reported feeling the most upset after writing and demonstrated increases in systolic blood pressure, compared to the control and trauma-factual subjects.

Most important, however, was that subjects in the trauma-combination cell visited the Student Health Center for illness in the 6 months following the experiment significantly less than those in the other conditions (see Fig. 3). Six-months follow-up questionnaires also showed a consistent pattern indicating that trauma-combination and trauma-emotion subjects felt healthier, reported fewer illnesses, and fewer days of restricted activity due to illness.

Although the study suffered from some weaknesses, it indicated that written—and anonymous—disclosure of traumatic experiences, while initially unpleasant for the individual, could reduce physician visits and improve health perceptions. Further, for long-term benefits to accrue, it appeared to be important for people to disclose not only the event but also the emotions aroused by the event.

In a recent extension of these findings, Janice Kleck-Glaser, Ronald Glaser, and I sought to learn if writing about traumatic experiences had a direct impact on immune function (Pennebaker *et al.*, 1988b). Over 4 consecutive days, 50 healthy undergraduates were randomly assigned to write either about the most upsetting events of their lives or about superficial topics. Blood samples were drawn from the participants before the first day of writing, the last day of writing, and a third time 6 weeks later. Using a blastogenic procedure, two related immune assays (relying on the mitogens Con A and PHA) were performed on the blood samples that measured the action of T lymphocytes. In addition to the immune

assays, we were also able to collect health center records for physician visits and self-report data from all of the subjects over the course of the study.

Two important results emerged from the immune study. First, compared to controls, individuals who wrote about traumas exhibited improved immune function from before to after the experiment (see Fig. 4). As in the earlier study, trauma subjects also evidenced a significant drop in health center visits for illness after participating in the experiment relative to controls. (This pattern of health-related results has also recently been replicated by Murray, Laminin, & Carver, 1988). Second, subjects in the trauma group were asked each day, "To what degree did you write about something which you have previously held back telling others?" Those who reported confronting previously inhibited topics were labeled High Disclosers and those below the median in response to the item were called Low Disclosers. As would be predicted, High Disclosers showed significantly greater immune improvements than Low Disclosers from before to after the writing portion of the study.

Taken together, both correlational and experimental findings with both normal

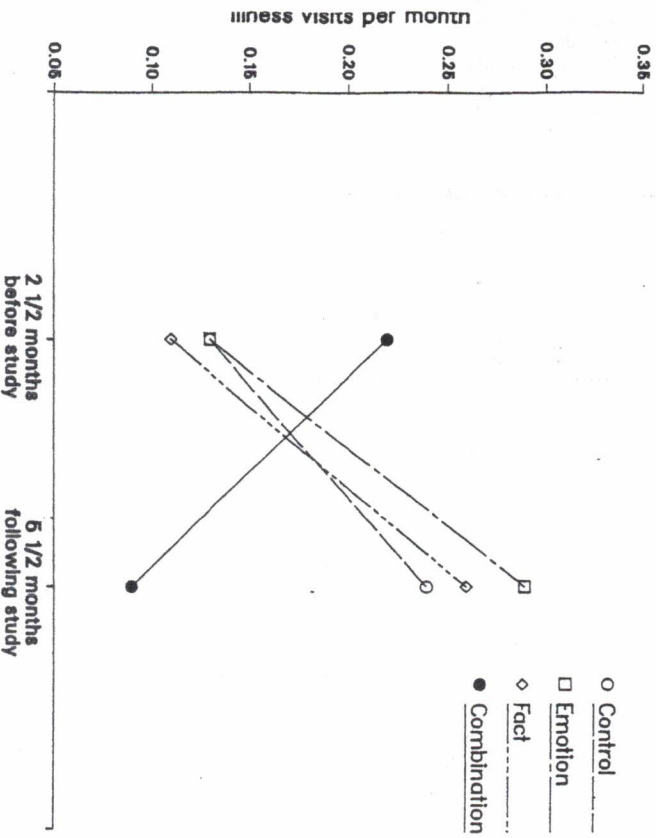


Fig. 3. Number of health center visits for illness per month as a function of writing topic (from Pennebaker & Beall, 1986).

and distressed samples indicate that confronting traumas—by either talking with others or writing—is associated with improved health status. In many respects, the writing studies offer a relatively pure test of the value of confronting traumas because people did not receive social support or other types of social feedback about their writing.

B. AUTONOMIC NERVOUS SYSTEM CORRELATES

In the past several years, a number of investigators have directly and indirectly studied the links between confession, emotional expressiveness, and autonomic activity. For example, polygraph researchers and practitioners have been interested in learning which autonomic indices reliably change when individuals do not "confess." Across a number of studies, measures of electrodermal activity are consistently superior to cardiovascular measures (e.g., heart rate, blood pressure) in discriminating between experimental subjects' telling lies from telling the truth

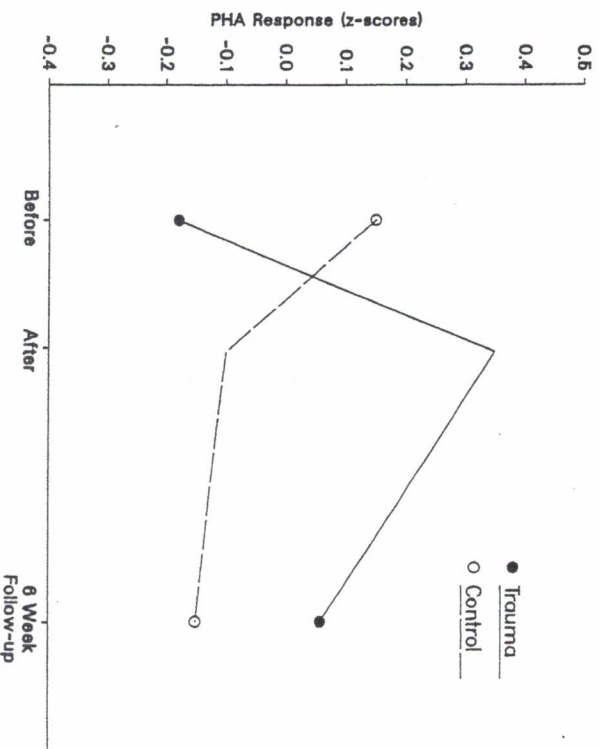


Fig. 4. Mean mitogen response to phytohemagglutinin (PHA) stimulation averaging across three concentration levels (5, 10, and 20 µg/ml of PHA) using blastogenesis. Higher numbers reflect greater immunocompetence (adapted from Pennebaker *et al.*, 1988b).

(see Waid & Orne, 1981 for an excellent review of this literature). Typically, during deception, skin conductance levels increase—which is associated with greater perspiration on the palms of the hand and soles of the feet.

In an important comparison of autonomic measures, Fowles (1980) summarized a large number of studies that indicated that electrodermal activity is associated with behavioral inhibition, whereas cardiovascular measures are linked to behavioral activation. The observations made by Fowles, which are based on the work of Gray (1975), square with work on emotional expression. For example, individuals who are emotionally expressive tend to have lower electrodermal activity than nonexpressive subjects (e.g., Buck, 1984). Using a within-subject design, we have found that SCL is highest when individuals naturally inhibit facial expressions during periods of deception (Pennebaker & Chew, 1985).

In an extension of these ideas, we have examined the links between disclosure of traumatic events and autonomic activity. We predicted that individuals who "let go" and disclosed the most upsetting experiences of their lives would exhibit lower SCLs than when asked to talk about superficial topics. In the first two experiments (Pennebaker, Hughes, & O'Heeron, 1987), subjects talked into a tape recorder about the most traumatic experiences of their lives, as well as their plans for the afternoon, for 3–5 minutes while SCL, heart rate, blood pressure, finger temperature, and corrugator EMG were periodically monitored. Independent judges listened to the recordings and assessed the degree to which each subject discussed events that were objectively personal and emotional. The ratings, then, served as an indicator for degree of disclosure.

Across the two studies, high disclosers evidenced lower SCL levels when talking about traumas than when discussing their plans for the day. Low disclosers evidenced the opposite pattern: higher SCLs during the traumatic topics. In other words, those subjects who "let go" and revealed the most personal and emotional sides of themselves could be discriminated on the basis of SCL drops. Interestingly, none of the other physiological measures differed as a function of degree of disclosure.

Do the autonomic changes in the lab relate to long-term health changes? We have just completed a large-scale study with 33 survivors of the Holocaust (mean age = 65, 17 males, 16 females) to answer this question (Pennebaker & Barger, 1988; Tiebout, 1987). As part of an ongoing archival project sponsored by the Dallas Memorial Center for Holocaust Studies, participants gave a 1–2 hour interview about their experiences during World War II. During the interview, the survivors were videotaped while SCL and heart rate (HR) were continuously monitored.

I cannot begin to express the magnitude of trauma that these individuals endured or the degree to which most currently live with their painful memories. Most of our survivors came from Poland (64%) and were Jewish (97%). Virtually all were displaced from their homes in 1939 and moved to ghettos. Between 1939 and 1942, virtually all witnessed or endured random beatings and saw friends

and relatives carried to their deaths. Between 1942 and 1945, most were herded into cattle cars and sent to one of several concentration camps. For 2 to 3 years, they lived with starvation, disease, and constant fear. The majority witnessed the deaths of children, close friends, and family members. No clear picture emerges why our participants survived while the overwhelming majority of their cohort did not. Some were on the brink of death when liberated by the Allies. About 30% escaped the ghettos or work camps and lived in hiding. Another 10–15% secured mental jobs in munition factories or as servants in Nazi officers' homes.

In the weeks following the interview, independent judges rated each videotape on a minute-by-minute basis as to the degree to which the participant was addressing a traumatic topic. Hence, if survivors were talking about the weather or their old neighborhood, their trauma score would be a 1 (on a 5-point scale). The maximum rating (5) was reserved for overwhelming horrors, such as watching their parents carried away to be killed. Across the 33 participants, interrater agreement was acceptable (mean $r = .60$). The mean trauma ratings were then entered, along with mean SCL and HR from the same 1-minute interval. For each subject, then, we were able to compute within-subject correlations reflecting the relationship between objectively coded trauma and both SCL and HR.

The logic of this approach was based on the idea that some people would "let go" while talking about significant traumas (and, thus, evidence negative correlations between trauma rating and SCL), and others would not. Further, based on our previous studies, we predicted that it would be better for one's physical health in the long run to disclose the deepest, most personal aspects of their experiences. In order to assess changes in long-term health, participants were contacted by phone 2 weeks before their interview and again 6–14 months after the interview. During the phone interviews, subjects were asked whether they had any continual health problems that required medical attention (for the pre-interview survey) and whether they had been to a physician for illness since the interview (63% had).

Overall, our predictions were borne out. The higher the rated trauma–SCL correlation, the more the participants visited a physician following the interview ($r[31] = .34, p = .05$), after controlling for the preinterview health status and the length of time between the interview and the follow-up interview. Similarly, the higher the participants' overall SCLs during the interview, the more physician visits ($r[31] = .57, p < 0.01$). Interestingly, the average level of rated trauma during the entire interview was unrelated to physician visits and mean SCL. As predicted, the trauma–HR correlations, as well as overall HR levels were unrelated to illness visits.

The results of the Holocaust project tie together much of the previous research that we have conducted on the effects of disclosure. Individuals differ tremendously in how they respond physiologically to disclosing traumatic experience. Drops in skin conductance during disclosure signal that the individuals are letting

go and, perhaps, coming to terms with their experiences (cf. Horowitz, 1976). Based on previous studies, this reduced autonomic activity indicates an overall reduction in inhibition or conflict concerning the events. Heightened SCL during disclosure, on the other hand, is indicative of ongoing conflict about the event. These people are not coming to terms with the event and are, perhaps, holding back or suppressing fundamental thoughts or feelings concerning their experiences.

C. CENTRAL NERVOUS SYSTEM ACTIVITY: CORTICAL CONGRUENCE

Although we have demonstrated that confronting traumas is correlated with short-term autonomic and longer-term health changes, we have not yet addressed *why* such relations exist. We believe that the ultimate answer lies in the fundamental cognitive changes that occur during and following our experiments. As is discussed in later sections, there are a number of ways by which to examine changes in cognitive function. A good departure point, however, is to consider how the brain might differentially process individuals' confronting traumas versus superficial topics.

It is beyond the scope of this article to discuss the organization and structure of the cerebral cortex. In recent years, however, a number of researchers have argued that different types of complex information can be processed concurrently and independently in different brain regions (e.g., Davidson, 1984; Gazzaniga, 1986; Luria, 1980). Further, information is differentially processed in the left versus the right hemispheres (Springer & Deutsch, 1986). Gazzaniga (1986), among others, suggests that conscious thought is highly dependent on processing in the language areas of the brain, which are typically located in the left temporal cortex. Emotions, especially negative feelings, are processed in the right frontal areas (Davidson, 1986).

Extrapolating from the work of Davidson, Gazzaniga, and others, it is useful to consider how the brain must process traumatic experiences under different conditions. For example, people who have experienced an upheaval in their lives must process a tremendous amount of sensory, visual, auditory, emotional, linguistic, and other types of information at multiple levels in several brain regions. Based on clinical experience, this process often takes days or weeks, depending on the severity of the trauma.

Imagine what must occur, however, if individuals actively try *not* to process certain parts of the trauma. The suppression of a complex thought is bound to be only partially successful (Wegner, 1988). Some components of an aversive thought will be processed in other regions of the cortex. For example, negative emotions will be processed in the right frontal lobe, which may or may not be available to consciousness. That is, if the language centers are overburdened with other types of information (often obsessive low-level thoughts or compulsive behaviors such as paying bills, or cleaning out the refrigerator), parts of the

trauma will be processed but not linguistically organized (cf. Kihlstrom, 1987).

If these ideas are true, we would predict that one effect of confronting traumatic events would be to bring about more coherent and efficient processing of information (i.e., *cortical congruence*). Our metaphorical model of cortical congruence would predict that brain wave activity on the two sides of the head would be more highly correlated when individuals write about traumas than about superficial events. Further, we would predict this relationship to be stronger for high disclosers.

In order to test the cortical congruence idea, 24 undergraduates wrote about the most traumatic experiences of their lives and about their plans for the day for 8 minutes each (Pennebaker & Sharp, 1988). Four times during each essay, subjects were asked to continue thinking about their writing topics while shutting—and not moving—their eyes. During each silent period, SCL, HR, and brain wave activity were monitored. Brain wave activity (EEG) was collected from four sites: the left and right frontal cortex and the left and right parietal cortex (F3, F4, P3, P4 international electrode placements). The EEG data were later period-analyzed on a second-by-second basis, thus yielding 20 1-second alpha and beta frequency periods for each task and for each electrode site. By simply correlating the frontal (left with right) and parietal (left with right) period analysis data across the 20 time-units for each subject and each task, we could assess the cortical congruence. That is, the more highly correlated the two corresponding lobes, the greater the cortical congruence.

As predicted, we found that writing about traumatic experiences was associated with higher interhemispheric correlations than writing about superficial topics for both frontal and parietal lobes ($F[1, 22] = 10.5, p < .01$). More intriguing, however, was the comparison between high and low disclosers. Based on the findings of the Pennebaker *et al.* (1987) project, we split subjects at the median into high and low disclosers, based on their mean SCLs during the trauma and the trivial tasks. Those whose SCLs were lower on the trauma than the trivial tasks were deemed high disclosers, the remainder low disclosers. As can be seen in Fig. 5, the overall interaction ($p < .01$) indicates that high disclosers evidence relatively greater cortical congruence when confronting traumas than low disclosers.

D. SUMMARY

When individuals are required to confront traumatic experiences, significant changes occur within the body. While talking or writing about traumas, compared with superficial topics, individuals evidence greater congruity in brain wave activity across the cerebral hemisphere, lower SCL, and improved immune function. These effects are most pronounced for high disclosers—that is, individuals who disclose extremely personal topics that they previously have actively held back from telling others.

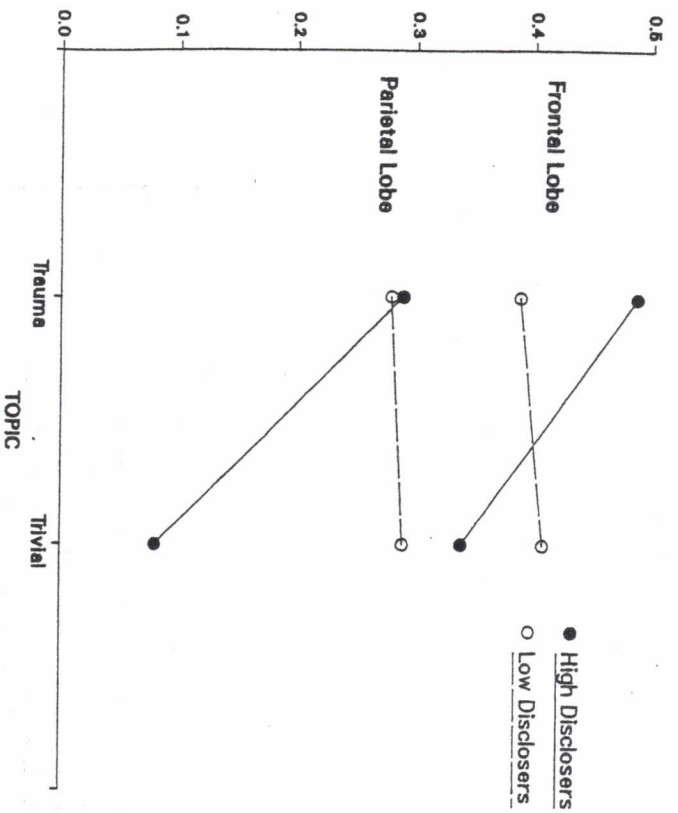


Fig. 5. Mean within-subject correlations between left and right hemispheric EEG during writing about traumas versus superficial topics for high versus low disclosers. Correlations are averaged over alpha and beta frequencies (from Pennebaker & Sharp, 1988).

IV. A Theory of Inhibition and Confrontation

The various findings that we have presented indicate that failing to confront traumas can be physically harmful, whereas talking or writing about them can be helpful. As we have conducted the various studies, we have gradually developed a general theory of inhibition and confrontation. After presenting the basic tenets of the theory, we consider how it is related to other models and perspectives.

1. THE THEORY

The basic ideas of our theory deal with two overlapping issues often seen when individuals face traumatic experiences. The first general process deals with inhibition; the second with confrontation.

1. Active Inhibitory Processes

These processes have the following characteristics:

1. To actively inhibit one's thoughts, feelings, or behaviors requires physiological work. By active inhibition, we mean that individuals must consciously restrain, hold back, or in some way exert effort to *not* think, feel, or behave. Note that this definition of inhibition deviates from that used by many animal learning psychologists, who often consider inhibition as an automatic, noneffortful response.

2. In the short run, inhibition is reflected by increases in SCL. Over time, the work of inhibition serves as a cumulative stressor on the body, which increases the probability of illness and other stress-related physical and psychological problems. Active inhibition can be viewed as one of many general stressors that affect the mind and body. Obviously, the harder one must work at inhibiting, the greater the stress on the body.

3. Active inhibition is also associated with potentially deleterious changes in information processing. In holding back significant thoughts and feelings associated with an event, individuals typically do not process the event fully. By not talking about an inhibited event, for example, individuals usually do not translate the event into language which, as is discussed in the next section, aids in the understanding and assimilation of the event. Consequently, significant experiences that are inhibited are likely to surface in the forms of ruminations, dreams, and associated cognitive symptoms.

2. Cognitive Consequences of Confrontation

In considering traumatic experiences, the opposite pole of active inhibition is confrontation. For lack of a better term, *confrontation* refers to individuals' actively thinking and/or talking about significant experiences, as well as acknowledging relevant emotions. Psychologically confronting traumas negates the effects of inhibition, both physiologically and cognitively.

1. The act of confronting a trauma immediately reduces the physiological work of inhibition. During confrontation, reduction in autonomic activity such as SCL is evident. Over time, if individuals continue to confront and thereby resolve the trauma, the overall physiological work is reduced, thereby lowering the overall stress level on the body.

2. More significant, however, is that confronting a trauma helps individuals to understand and ultimately assimilate the event. By talking or writing about previously inhibited experiences, individuals translate the event into language. Once encoded linguistically, individuals can more readily understand, find meaning in, or attain closure of the experience.

B. LINKS TO OTHER PERSPECTIVES

As should be clear, our work has been heavily influenced by investigators in psychoanalysis, social cognition, psychophysiology, and animal research. This section briefly outlines the similarities and differences of our theory with those in other areas.

1. *The Psychoanalytic Tradition*

Much of Freud's work was based on studying individuals who had experienced traumatic events in childhood. His early work with Breuer (Breuer & Freud, 1895/1966), for example, focused on the *cathartic method*, whereby patients were encouraged to talk in a stream-of-consciousness manner about their deepest thoughts and feelings surrounding the probable causes of their symptoms. The success of the cathartic method was attributed to the discharge of repressed emotions surrounding the event. Despite the apparent early successes of the cathartic method, Freud later came to believe that the mere expression of repressed emotions did not bring about a permanent cure (Freud, 1920/1966). Although our approach is similar to the cathartic method in several ways, it differs in emphasizing the value of conscious thoughts and feelings rather than the sole expression of pent-up emotions.

A particularly promising evolution in the psychoanalytic approach has been put forward by Mardi Horowitz (1976, 1987). Using a variety of clinical and experimental techniques, Horowitz has developed an elaborate model that incorporates a number of features from cognitive psychology. According to Horowitz, stressful events are processed along three interdependent systems roughly corresponding to perception-cognition, emotion, and cognitive-behavioral control. Although repressed thoughts and feelings can influence the symptoms of traumatic experience, Horowitz is most concerned with the cognitive problems surrounding stress responses.

Drawing heavily on a completion tendency akin to the Zeigarnik effect, Horowitz posits that individuals suffer from ruminations and negative emotions if they are unable to psychologically finish a trauma. By working through an upsetting event—either naturally or in therapy—the individuals ultimately complete the trauma and assimilate it into their self-concepts or schemata. Indeed, this process naturally occurs in a series of stages following a trauma: denial, working through, and assimilation. Although Horowitz has focused heavily on certain types of psychological symptoms often associated with posttraumatic stress disorder (PTSD), he has not considered the underlying physiological causes and effects of inhibition per se.

2. *Cognitive Approaches*

As the work of Horowitz suggests, a number of perspectives associated with our understanding responses to trauma have been heavily influenced by cognitive

models. Features of three overlapping models are particularly relevant to our theory of inhibition and confrontation. These include general information-processing approaches from social psychology, clinically based cognitive models, and work on the suppression of thoughts.

a. Information-Processing Approaches. Many social psychologists have found strict information-processing approaches particularly appealing because of their abilities to link perception, thought, and memory to a variety of phenomena. Recently, for example, Wyer and Srull (1986) have argued that thought can be likened to an elaborate computer program. Central to their argument is the idea that most thoughts are guided by immediate as well as long-term goals. Consequently, most thoughts are focused on completing either externally imposed or intrinsically generated plans and goals. When people do not have any salient goals at a particular time, thoughts are generated in a semirandom manner. Like other similar approaches (e.g., Martin & Tesser, 1988), the Wyer and Srull model is useful in considering how traumas can both disrupt goals and bring about a reordering of new goal information. Indeed, if we assume that understanding an important event is a basic human goal (which is consistent with a variety of theories—Horowitz, 1976; Janoff-Bulman, 1985; Silver & Wortman, 1980), we can better appreciate why so many of our thoughts deal with a trauma after it has occurred. Despite the general appeal of most information-processing approaches, they do not deal with the problem of how or why people actively avoid thinking about specific events.

b. The Suppression and Repression of Thoughts. An interesting approach to remedy this problem has been suggested by Dan Wegner and his colleagues (Wegner, 1988; Wegner, Schneider, Carter, & White, 1987). In this work, Wegner considers the problem of how and why people try to suppress thoughts. Across a number of studies, Wegner finds that people are remarkably bad at not thinking about topics. For example, when told not to think of white bears, people think about them almost as much as if they were told to think of the bears. According to Wegner, the failure of thought suppression lies in the fact that a person must, at some level, be aware of a thought in order to suppress it. Further, the most common thought-suppression strategy is distraction. The problem with distraction is that whatever a person uses to avoid the suppressed thought becomes inexorably tied to the suppressed thought. Over time, then, virtually everything soon reminds the person of the suppressed thought.

Following from Wegner's work, one value of writing or talking about traumatic experiences is that it stops the work of suppression. Indeed, as we found with individuals whose spouses had died unexpectedly, the more they talked about the death, the less they reported ruminating about it (Pennebaker & O'Heeron, 1984).

A parallel approach to understanding thought suppression has been to examine nonconscious mental processes. Unlike suppression, which refers to the conscious avoidance of thoughts, unconscious mental processes include those thoughts, memories, or schemas that are beyond awareness. In an impressive survey of

the literature, Kihlstrom (1987) argues that certain perceptual-cognitive and motoric skills can be automatized through experience, thus rendering them non-conscious. Experienced typists, for example, have great difficulty in writing out the correct key sequence of their typewriters because the automatic act of typing has caused their implicit knowledge of the keyboard to become unconsciously coded (cf. Bargh, 1984). Interestingly, the only way that experienced typists are able to reproduce which letters go with which keys is to consciously reconstruct the letters by imagining typing words or letters in their minds.

One can readily appreciate how significant traumas in childhood and beyond may become so rehearsed through ruminative thinking or repeated experience that they evolve into nonconscious mental structures that affect how individuals perceive and think about their worlds on a daily basis. One benefit of writing or talking about traumatic experiences, then, may be to reconstruct and/or make concrete some of the preconscious or nonconscious mental processes that guide the person's conscious thoughts.

c. Cognitively Oriented Clinical Perspectives. Over the past three decades, a number of clinical and personality psychologists have pointed to the importance of considering cognitive processes in the evaluation and treatment of mental disorders. Beck (1976), Ellis (1962), Meichenbaum (1977), and others have argued that individuals often develop maladaptive ways of perceiving and thinking about themselves and their worlds. Through early experience or other means, for example, individuals may unconsciously assume that they are bad people. Although not necessarily aware of this assumption, these people will experience tremendous conflict when they succeed or are held in high esteem by others. The purpose of therapy, then, is to make these fundamental assumptions about the world explicit and ultimately to change them.

An interesting application of this perspective to PTSD can be seen in Epstein's (1980, 1988) cognitive-experiential self-theory. Epstein emphasizes preconscious cognitions that determine the automatic assessment of daily events. Three fundamental motives affect the structure of preconscious cognitions: (1) need for pleasure and avoidance of pain, (2) need for a sense of coherence to assimilate reality, and (3) need for a favorable level of self-esteem. Suffering a traumatic experience, according to Epstein, serves as a 'personality smasher' in that it establishes or invalidates one or more of the basic preconscious cognitive structures. In order to cope with the trauma, PTSD sufferers may reorganize their self-system using fear, anger, withdrawal, or dissociation as organizing schema. Following a war-related trauma, for example, a person may assimilate the experience around the belief that the world is threatening. Although memories and thoughts about the war experiences may become understandable, the individual now interprets all stimuli as potentially dangerous, thus resulting in states of ironic hyperalertness and anxiety.

As with other cognitive therapists, Epstein believes that an important solution to PTSD is to train people to recognize their preconscious interpretations of events. He also suggests that PTSD victims should be encouraged to confront their fears,

in an effort to extinguish them. Finally, they must be exposed to experiences that counteract their views that the world is malevolent, using a variety of counterlearning techniques. Interestingly, although our writing and talking techniques have not found direct evidence of counterlearning, it appears that confronting traumatic experience in the laboratory influences preconscious interpretations of events and, indirectly, promotes the extinction of the powerful emotions associated with them.

3. *Animal Learning and Psychophysiology*

The concept of inhibition has featured prominently in the history of animal learning. Pavlov (1927), Spence (1936), and Hull (1950) considered inhibitory processes as the major factor in the weakening of conditioned responses normally seen in extinction. Whereas early learning theorists viewed inhibition as an automatic or nonvoluntary process, more recent thinkers have considered inhibition to be a powerful voluntary and controllable phenomenon (cf. Terrace, 1972).

For several years, Jeffrey Gray (1975) has been investigating the physiological substrates of inhibition and activation. Using paradigms that involve passive avoidance (wherein the animal must not perform a learned behavior in order to avoid punishment), he reports that there is an increase in activity in the behavioral inhibition system (BIS), which is located in the septum and hippocampus. Further, when the activity of the BIS is blocked by drugs or destroyed, rats exhibit a marked decline in the ability to inhibit behaviors. Other studies suggest that the frontal cortex is also directly related to inhibition (e.g., Luria, 1980). As in the famous case of Phineas Gage, when the human frontal lobe is destroyed, individuals become more impulsive and less inhibited, without appreciable loss of cognitive functioning.

More recently, Fowles (1980) has argued that autonomic measures selectively tap psychological processes associated with inhibition and activation. Inhibition, according to Fowles, is reflected in heightened electrodermal activity such as SCL. Variations in activation, on the other hand, can be seen in cardiovascular activity. In the studies in our own laboratory, we have consistently found that when individuals disclose traumatic experiences, SCLs drop, whereas cardiovascular measures (e.g., HR, blood pressure) are either unaffected or increase.

A particularly exciting development has been research linking individual difference measures of inhibition with physiological activity. For example, measures of repressive coping style are associated with overall increased autonomic activity (Weinberger, Schwartz, & Davidson, 1979), major heart problems (Lane & Schwartz, 1987), and disruptions in immune function (Jamner, Schwartz, & Leigh, 1988). Other measures of inhibition, such as level of socialization (Waid & Orne, 1982), lack of emotional expressiveness (Buck, 1984; Notarius & Levenson, 1979), and suppressed hostility (Dimsdale, *et al.*, 1986) have also been found to predict increased autonomic activity and/or long-term health problems.

V. Implications and Future Directions

Our findings surrounding inhibition and confrontation raise a number of questions about emotion, cognition, and psychosomatic processes. This section examines some classical theoretical problems relevant to social psychology. It begins by reconsidering the classic debate about the nature of catharsis. It then focuses on some central issues surrounding the development and reconstruction of the self. Finally, I argue for a more physiologically based approach to social psychology.

A. CATHARSIS VERSUS INSIGHT

Do our collective studies support the value of catharsis or of insight in the reduction of stress? Ironically, our technique of writing or talking about traumatic experience is remarkably similar to Breuer and Freud's cathartic method. Unfortunately, the definition of catharsis has evolved to mean the mere venting of negative emotions (e.g., Scheff, 1979) rather than the expression of both emotions and thoughts. Using the venting definition of catharsis, most well-controlled studies indicate that negative emotional expression is either harmful or has no effect (e.g., Berkowitz, 1982).

Close examination of our studies points to the fact that the mere expression of negative feelings exacerbate those feelings immediately after each study. In other words, venting quickly increases reports of depression, sadness, anger, and guilt. Although negative feelings are temporarily increased, the adverse side effects of venting do not persist over time. By the same token, we have not found that venting has appreciably improved physical health.

Taken together, we think that the value of our cathartic method lies in the insight people get from expressing and becoming aware of both their deepest emotions and their related thoughts. In short, the health effects apparently reflect insight rather than venting. Recall from the Pennebaker and Beall (1986) experiment, only those subjects who wrote about their thoughts and emotions evidenced improved health relative to subjects who wrote only about their emotions or about facts surrounding their traumatic experiences.

More persuasive are the open-ended responses that subjects give on follow-up questionnaires about the long-term effects of participating in our studies. In our most recent study (Pennebaker *et al.*, 1988a), 71 of the 80 experimental subjects responded to an open-ended question on the follow-up questionnaire, "Now that the experiment is completed, could you tell us how it may have influenced you in the long run?" Only 7 (10%) discussed the value of venting by reporting such things as, "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. Examples include,

"It made me think things out and really realize what my problem is," "It helped me 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 used terminology unrelated to either approach.

An illustrative case distinguishing between venting and insight concerns a 33-year-old male's insomnia caused by intense feelings of anger. Unable to sleep, the subject got up and, at my instruction, wrote about his deepest feelings concerning the cause of his anger. In his writing, he discussed his plans for revenge on the person who had offended him. His venting was indeed graphic with allusions to torture, mutilation, and artistic humiliation. Although the subject returned to bed, he found that he was even more obsessed with feelings of rage. He then returned to his writing pad and wrote about his anger from a self-reflective perspective. That is, he explored why he was so upset, why the offending person touched such a raw nerve, and so on. On completing the second essay, he returned to bed and fell immediately to sleep. As this case study illustrates, the awareness and understanding of the emotion decreased its intensity. The mere expression, however, intensified it (see Berkowitz, Green, & Macaulay, 1962 for a similar distinction between self-reflective versus expressed hostility).

B. RECONSTRUCTING THE SELF

Writing about traumatic and other significant feelings clearly can bring about long-term changes in psychological and physiological health. Why is this remarkably simple technique so powerful? As discussed previously, a critical dimension to confronting personal experiences is that it forces the assimilation of a variety of types of information. Suppressed thoughts and emotions, conflicting beliefs and self-perceptions, and unflattering self-views face the writer. When confronted with an array of important information, the person struggles, and usually succeeds to some degree, to reorder it. The assimilation of information within the writing paradigm raises a number of intriguing issues about how fundamental aspects of the self can be broken down and reconstructed. Indeed, processes akin to our writing technique are apparent in psychotherapy, thought reform, and education.

1. Psychotherapy

According to both cognitive and psychodynamic clinical psychologists, one of the goals of psychotherapy is to understand the underlying causes of current symptoms and, depending on the theorist, to force a realignment of basic belief and perceptual structures (cf. Epstein, 1988; Meichenbaum, 1977). A common technique used to achieve this goal is to get the client to talk about, analyze, and interpret significant early experiences—especially if they are directly relevant to the presenting symptoms. As most clinicians note, this process is far easier

, accomplish if the client's defenses are lowered and the client displays a high degree of trust in the therapist (or transference).

Interestingly, the writing technique appears to accomplish some of these same goals without the traditional client-therapist relationship. When individuals write about traumas, their defenses are almost automatically lowered—because it is difficult to accomplish the task otherwise. Writing about traumas also forces individuals to dredge up psychological conflicts and intimate emotions that few other topics arouse. Once the defenses are lowered and conflicting aspects of the self are salient, the individual actively seeks to resolve the conflicts.

Obviously, the writing approach should not be construed as an alternative to psychotherapy. Psychotherapy may accelerate the assimilation process, in that a clinician can point to conflicts that the client cannot (or will not) see. An interesting study by Murray, Lammitt, and Carver (1988) points to another benefit. In their study, healthy college students either wrote about traumatic experience, about superficial topics, or were seen in a therapy session on two occasions, a week apart. The nondirective therapy was superior to trauma writing in bringing about positive moods immediately after each of the sessions. In other words, the therapists were able to bring about a comparable degree of disclosure compared with the trauma writing, but their contact with the subjects forestalled feelings of sadness or depression. Unfortunately, the authors were able to collect follow-up measures on only about half of their sample. With their reduced sample, however, both writing about traumas and brief psychotherapy reduced subsequent health problems relative to control subjects.

Although not a substitute for therapy, we think that writing about traumatic and/or significant experiences can be considered a form of psychic preventive maintenance. Given our findings, it may be puzzling why more people do not write spontaneously. In our surveys, we find that about 8–20% of college students keep a diary or journal—at least occasionally. However, even among journal-keepers, many do not record many of their deepest thoughts and feelings. In interviewing several, most report that they often forget to keep their diaries during stressful periods because it is too painful. Indeed, like the subjects in our experiments, journal writers know that writing about traumatic and upsetting experiences often results in sadness, depression, and a period of serious introspection.

2. *Thought Reform and Brainwashing*

Consider briefly those religious, political, and self-help institutions that have produced impressively dedicated followers by bringing about fundamental value and belief changes. A common feature of many "born-again" movements, political thought reform groups, and self-help groups, such as Alcoholics Anonymous, is the more commercial ventures such as "est" (now called The Forum) is the public confession of personal traumas and shortcomings. Even in many of the more traditional religions, the confession of sins is strongly encouraged—either

in the form of talking to a priest or directly to one's god in the form of prayer.

Based on our findings, one can readily appreciate why public confession is so effective. When individuals publicly confront their most intimate experiences, they are in the position of having to assimilate them within the context of the values of the group. The goals and the values of the group, then, become part of the information that the member must incorporate into his or her new self-concept.

An interesting implication of this idea is that attitude change should be most enduring when persuasive messages are used in conjunction with the evocation and generation of significant personal experiences. Note that this approach is fundamentally different from most attribution or dissonance-reduction models. That is, attitudes can be assimilated into one's basic value system through the fundamental reconstruction of the self (cf. Spence, 1987 for a discussion of similar processes seen in psychotherapy).

3. *Education*

The primary goal of undergraduate education is to get our students to incorporate the theories and facts that we teach them into their understanding of the world. We all secretly hope that each of our eager students will assimilate our views and, when we meet them in 20 years, they will profusely thank us for changing their world views. Why does this so rarely happen? The secret may lie, in part, on the way we teach. Our lectures and movies force the students to be passive recipients of information. Our multiple choice exams actively discourage the integration of information. Even many of our most passionate lectures fail to get our students to incorporate our ideas into their basic value systems.

The work we have done on traumatic experience suggests a relatively simple alternative form of education. Specifically, students should be actively encouraged to write or talk about our facts and theories within the context of their most personal experiences. Indeed, we have developed a class with multiple course sections, where, in one of the sections, students are required to write about their deepest thoughts and feelings associated with the topic of the lecture and reading on that particular day during the first 15 minutes of class. Preliminary findings indicate that absentee rates are lower, test grades are higher, and class discussions are significantly livelier in the experimental section (see also Graves & Stuart, 1985, and Elbow, 1981, using a similar application in English courses for grade school and college, respectively).

C. SOCIAL PSYCHOLOGY AND PSYCHOSOMATICS

Fortunately, the social cognition revolution in social psychology is running low on ammunition. Perhaps its major failure has been to overlook the fundamental role of conflict, inhibition, and stress. We often forget that information processing

kes place in the brain, which is an exquisite biochemical organ intimately linked with the rest of the body. During periods of conflict or, perhaps, information overload, the brain uses more energy, which, in turn, affects all other parts of the body. Emotion, stress, and disease are the direct results—and sometimes the uses—of cognitive activity.

Changes in health and psychophysiological activity provide a fascinating glimpse at the ways people think and respond to daily events. As psychosomatic searchers have long known, illness is not a random occurrence. Indeed, most illnesses covary with significant changes in people's social lives, such as divorce, loss, rejection, and social conflict—that is, the very stuff of social psychology. The reason we have not adopted a more psychosomatic approach is that we are used to thinking in cause-effect terms that span only seconds or minutes. If we are under massive stress today and then get sick a week later, we often scan our environment for a more proximal cause, such as what we ate or who we saw a few hours before our illness.

In considering the health effects of stress, social psychologists must move away from relying solely on self-reports of symptoms, distress, or general health complaints and focus more on objective physiological measures. As we and others have found, self-reports are notoriously colored by mood states and neuroticism (e.g., Costa & McCrae, 1985; Pennebaker, 1982; Watson & Pennebaker, 1988). Indeed, many of our presumed independent variables such as perceived stress are conceptually identical to our dependent measures, such as complaints about health.

Within the past few years, technology has changed significantly, which will allow social psychologists to consider biological markers as viable measures. Whereas the measurement of simple autonomic activity used to cost tens of thousands of dollars, it can now be achieved for less than a thousand and involves minimal training. Similarly, rapid advances in psychoimmunology is providing short-term and long-term markers of immune function at rapidly lowering costs (e.g., Kiecolt-Glaser & Glaser, 1988). In short, we can now expand the main of social cognition, group, and personality research by considering the old.

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A SOCIOCOGNITIVE MODEL OF ATTITUDE STRUCTURE AND FUNCTION

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I. Introduction

In 1935, Gordon Allport declared that attitude is "social psychology's most indispensable concept." That observation remains true today, as evidenced by common practices within the discipline of social psychology. Attitudes receive prominent treatment by social psychology textbook authors. They are often used to explain such diverse phenomena as prejudice, interpersonal attraction, consumer behavior, organizational behavior, human sexuality, mass communications, social influence, and the self-concept. As McGuire (1969) points out, attitudes are often a high-volume research area for psychology, accounting for large amounts of psychological research at given times. And as Katz and Stotland (1959) noted, the attitude concept finds employment in all the major theoretical schools of social psychology including field, behavioral, cognitive, mathematical, and expectancy-value approaches.

A. BUT IS THE ATTITUDE CONCEPT REALLY NEEDED?

The history of attitude research presents a paradox (see Katz & Stotland, 1959). Despite the perceived importance and the popularity of the attitude construct, it has been severely criticized, with some calling for it to be abandoned. Disillusionment with the attitude concept stems from three basic concerns.

1. Attitudes appear to be poor predictors of behavior toward their objects. In his definition of attitudes, Allport (1935) explicitly specified that attitudes