DISCLOSURE OF TRAUMAS AND PSYCHOSOMATIC PROCESSES

JAMES W. PENNEBAKER and JOAN R. SUSMAN
Department of Psychology, Southern Methodist University, Dallas, TX 75275, U.S.A.

Abstract—Results from a series of studies are summarized in support of a general theory of inhibition and psychosomatics. According to this view, to inhibit thoughts, feelings, or behaviors is associated with physiological work. In the short term, inhibition results in increased autonomic nervous system activity. Over time, inhibition serves as a cumulative stressor that increases the probability of psychosomatic disease. Actively avoiding thoughts and feelings surrounding a trauma and/or not discussing a trauma is a particularly insidious form of inhibition. The results from recent surveys and experiments indicate: (a) childhood traumatic experiences, particularly those never discussed, are highly correlated with current health problems; (b) recent traumas that are not discussed are linked with increased health problems and ruminations about the traumas; (c) requiring individuals to confront earlier traumas in writing improves health and immune system functioning; (d) actively talking about upsetting experiences is associated with immediate reductions in selected autonomic activity. Implications of these findings for our understanding of disclosure, trauma, and disease are discussed.

Most living organisms seek to learn about contingencies of rewards and punishments in their environments. Humans are unique, however, in wanting to understand themselves as well as the world around them. Striving for understanding of the environment and self, then, serves as a fundamental human motive.

The issue of understanding the world is particularly relevant to our confronting upsetting or traumatic experiences. If we get a parking ticket, we may briefly ponder our sin, put it into perspective, pay the fine, and ultimately forget it. Such a minor trauma may cause slight anxiety and cause us to think briefly about the nature of cars, parking slots, and the role of police in our society. Other traumas are not dispensed with so easily. If we were molested as children, fired from our jobs, or mugged, far more physiological and cognitive activity would ensue.

A fundamental psychological question concerns how we come to find meaning in traumatic experiences. In this paper, we present the results from several studies that indicate that talking about—or in some way confronting—traumatic experiences is psychologically and physically beneficial. As will be seen, the positive health effects of disclosing traumatic events are consistent with our developing psychosomatic theory of inhibition.

Four general topics will be addressed. First, we present an overview of a general theory of inhibition and its link to disease. Second, the results from recent surveys are discussed that indicate that childhood and recent traumatic experiences that are disclosed have fewer negative health effects than events that are not confided. Third, we summarize the results from recent studies indicating that induced disclosure within a laboratory setting is associated with long-term health and immune system benefits. Finally, we present evidence which indicates that talking about traumatic events is linked with autonomic nervous system changes viewed as reflections of inhibitory processes.

A PSYCHOSOMATIC THEORY OF INHIBITION

To inhibit ongoing behavior, thoughts, or feelings requires physiological work. In the short run, inhibition is manifested by increases in autonomic nervous system activity [1] and by increased firing in specific regions of the brain [2]. Over time, the work of inhibition serves as a low level but cumulative stressor. As with all cumulative stressors, inhibition over time is associated with increases in stress related diseases [3].

A particularly significant source of inhibition can be seen among individuals who have experienced psychological traumas. A natural tendency to such events is to talk with others about them. However, if individuals are unable to disclose the traumas because of embarrassment, fear of punishment, etc., they must constantly hold back or inhibit their thoughts, feelings, and behaviors from others and, on occasion, themselves. Not discussing traumatic events with others, then, represents a significant long-term physical stressor.

Based on these views of inhibition, we predict the following:

1. Individuals who have suffered a trauma will experience significantly more adverse health effects if they have not confided the trauma with others than if they have confided it. Further, childhood traumas should correlate more highly with disease than recent traumas to the degree that the deleterious effects of inhibition are cumulative.

2. Because disclosing a trauma helps the person to understand the trauma better, the failure to disclose a trauma should be associated with increased ruminations about the traumas.

3. Requiring individuals to disclose or directly confront earlier traumas should improve health and reduce ruminations.

Note that many of the assumptions and predictions
linked to this model of inhibition are also central to several perspectives in psychotherapy, psychology, and related disciplines. The early works of Breuer and Freud [4], Dunbar [5], Alexander [6], and Wolff [7] posited inhibitory processes in the etiology of psychological and physical problems. More recently, psychotherapists who have been influenced by either psychodynamic [8, 9] or cognitive [10] schools have emphasized the dangers of inhibiting and the advantages of confronting significant psychological traumas. In short, many of these views are well accepted by many psychotherapists.

DISCLOSURE, INHIBITION, AND DISEASE: CORRELATIONAL EVIDENCE

It is well documented that major life events and psychological traumas in adulthood are associated with negative health effects in both retrospective [11] and prospective [12] studies. More recently, several investigators have offered compelling evidence to indicate that a positive social support network can buffer the effects of recent life changes [13]. A common concern raised by critics of the social support literature has been that it is difficult to isolate which components of social support contribute to the stress-buffering effect.

Based on our theory of inhibition, a number of propositions are apparent when considering the life events literature. First, if not talking about a trauma is considered a form of inhibition, we would predict that actively talking about a trauma would buffer the effects of the trauma. Indeed, we would predict that talking about a specific trauma would benefit a person even when measures of social support were statistically controlled. Second, if the effects of inhibition are cumulative, it would follow that traumas that occurred earlier in life would produce more health problems than traumas that occurred recently.

Note that both of these predictions run counter to current thinking in most social psychological circles. Nevertheless, they are compatible with a number of traditional clinical observations. Sidney Jourard [14], for example, argued that self-disclosure concerning sources of interpersonal conflict was physically beneficial. Despite the pervasive influence that Sigmund Freud has had on 20th century thought, few empirical studies have examined the long-term effects of early childhood traumas on health. Freud [15] was quite specific in pointing to the roles of early experience in determining the development of personality and, presumably, health-related behavior patterns.

Although we have conducted several correlational studies that yield conceptually similar results [16], we briefly present findings from two surveys that demonstrate the links between confiding a traumatic experience and health outcomes. The first, which was based on 200 employees of a large white collar corporation, compared childhood with recent traumas. The second survey dealt with a sample of adults who had all experienced the death of a spouse in the year preceding their receiving the questionnaire.

Corporate sample findings

In all, 384 employees of a large Texas-based corporation were asked to complete a series of questionnaires as part of a student project. The questionnaire packet included the SMU Illness Questionnaire [17], an internally consistent and valid 49-item checklist that assesses major (e.g. cancer, heart disease) and minor (colds, headache) health problems which have occurred within the last year. The various health problems can be summed, yielding an illness index, or the binary items can be analyzed separately. In addition, subjects completed measures of early (prior to the age of 17) and recent (within the last three years) traumatic experiences. Five types of childhood traumas were examined: traumatic sexual, divorce or separation of parents, death of family member or very close friend, victim of violence, or 'other' trauma. Although the same traumas were included for recent traumas, the divorce/separation item referred to the subject rather than his or her parents.

Of the 204 questionnaires that were returned (53% return rate), four were incomplete. For each trauma, the 200 subjects (mean age = 35.1, 75% females) listed the age of occurrence, the degree to which it was upsetting (seven-point scale, where 7 = extremely upsetting), and the degree to which they confided in others about the trauma (7 = confided a great deal). As can be seen in Table 1, the subjects were assigned to three groups: those with no childhood traumas (no trauma group), those with one or more traumas, all of which had been confided about (trauma—confide group), and those with one or more traumas of which at least one had not been confided (trauma—no confide). Two general findings bear mention. First, a remarkably high number of individuals reported having experienced major traumas prior to the age of 17 and within the last three years. Second, childhood traumas were far less likely to be confided than were adulthood traumas.

In terms of current health problems, the trauma—no confide subjects were more likely to have reported both major and minor health problems, such as cancer and high blood pressure, as well as weight loss and skin rashes within the last year. As can be seen at the bottom of Table 1, the childhood trauma groups evidenced significantly higher overall illness scores as well as total physician visits in the previous year for illness compared with the no trauma group.

A particularly significant finding from this study was that early childhood traumatic experiences were more related to current health problems than were recent traumas. As depicted in Table 2, a multiple regression analysis that controlled for demographic variables (sex, age, education) and indicators of social support (number of very close friends that are female and male) examined the relative contribution of recent and early childhood traumas on the total illness index. A dummy coding procedure was employed using the binary group assignment scores as predictors. Order of entry into the equation was forced as depicted in the table. Not only did the experience of an early trauma significantly aid in predicting health problems but whether they were not confided added additional predictive power.

Sudden death of spouse

Robin O'Heeron and the first author [18] were able to get coroner's records of everyone in a large metro-
Disclosure of traumas and psychosomatic processes

Table 1. Percentages of individuals experiencing and disclosing childhood and recent traumas and means of illness indicators

<table>
<thead>
<tr>
<th>Variable</th>
<th>Childhood</th>
<th>Recent</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No trauma</td>
<td>Trauma—confided</td>
<td>No trauma</td>
<td>Trauma—confided</td>
</tr>
<tr>
<td>Death (family or close friend)</td>
<td>74.5</td>
<td>11.5</td>
<td>14.0</td>
<td>77.0</td>
</tr>
<tr>
<td>Divorce or separation</td>
<td>86.5</td>
<td>1.5</td>
<td>12.0</td>
<td>85.0</td>
</tr>
<tr>
<td>Sexual trauma</td>
<td>92.0</td>
<td>2.5</td>
<td>5.5</td>
<td>98.0</td>
</tr>
<tr>
<td>Violence</td>
<td>95.0</td>
<td>1.0</td>
<td>4.0</td>
<td>94.0</td>
</tr>
<tr>
<td>Other trauma</td>
<td>79.5</td>
<td>5.5</td>
<td>15.0</td>
<td>82.0</td>
</tr>
</tbody>
</table>

Health means:†
- Total illness 5.53b 7.57b 8.60b 6.26 7.35 7.64
- Physician visits for illness 1.14b 1.75b 2.00b 1.10b 1.91b 2.07b

*Percentages in the trauma groups are based on subjects who checked that the experience was extremely traumatic (6 or 7 on seven-point scale, where 7 = extremely traumatic). Assignment to trauma—confiding groups required subjects to endorse their degree of confiding about the trauma as 6 or 7, where 7 = confided a great deal.
†Means are based on three-group one-way ANOVAs. Means with different subscripts are significantly different at P < 0.05 using contrasts based on mean-square error term.

The metropolitan area who had committed suicide or had died in a car accident during the 1983 calendar year. From the records, we selected all cases wherein the suicide or accident victim had been married, between the ages of 25 and 45, and had died within 24 hr. Questionnaires were sent to the surviving spouses approximately one year after the death. Sixty-two percent of those receiving the questionnaires returned them, resulting in a total of 19 cases. Three primary variables were of interest: the nature of their illnesses in the year following the death, the degree to which they had talked with others about their spouses’ death, and the degree to which they thought about their spouses’ death.

Three important and significant findings emerged: the more that the respondents talked about their spouses’ death, the fewer health problems they had the following year; the more they talked about the death, the less they ruminated about it; the more they ruminated about the death, the more health problems. Interestingly, spouses of car accident victims were worse off than suicide victims—they talked less, ruminated more, and had more health problems.

Summary

The surveys conducted on the relatively healthy corporate sample and the spouses of sudden death are interesting because they point to the importance of confiding. They are, of course, correlational and therefore subject to a number of alternative interpretations—such as confiders are simply more resilient to stress than nontalkers. Clearly, some experimental studies were needed.

Table 2. Summary table of regression of self-reported illnesses with recent and childhood traumas as predictors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Simple r</th>
<th>R² change</th>
<th>Beta</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>0.27</td>
<td>0.14</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.11</td>
<td>-0.15</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-0.28</td>
<td>-0.22</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>(Summary)</td>
<td>0.389</td>
<td>0.152</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social support</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female friends</td>
<td>-0.05</td>
<td>-0.05</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>Male friends</td>
<td>-0.17</td>
<td>-0.04</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>(Summary)</td>
<td>0.393</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recent traumatic experience</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trauma occur</td>
<td>0.16</td>
<td>0.007</td>
<td>0.03</td>
<td>0.45</td>
</tr>
<tr>
<td>Not confided</td>
<td>0.07</td>
<td>0.000</td>
<td>-0.07</td>
<td>0.35</td>
</tr>
<tr>
<td><strong>Childhood traumatic experience</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trauma occur</td>
<td>0.24</td>
<td>0.025</td>
<td>0.20</td>
<td>0.01</td>
</tr>
<tr>
<td>Not confided</td>
<td>0.26</td>
<td>0.048</td>
<td>0.23</td>
<td>0.01</td>
</tr>
<tr>
<td>Multiple R</td>
<td>0.485</td>
<td></td>
<td></td>
<td>0.235</td>
</tr>
<tr>
<td>Multiple R²</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Sex is coded 1 = male, 2 = female. N = 197. For simple Pearson r to attain significance at P < 0.05 (two-tailed), r ≥ 0.139. Beta weights and their significance levels are based on the full regression model.
INDUCED CONFESSION AND DISEASE PROCESSES

Whereas the previous studies dealt with reports of talking about traumas, our first laboratory confession experiments used writing rather than talking about traumas. One problem in having people talk about their deepest traumas was that we wanted to avoid active interaction with others. In other words, we wanted to discover the pure health effects of psychologically confronting upsetting topics. To date, we have conducted two experiments using the writing methodology. The first study [19] relied on physician visits that subjects made to the student health center for illness and compared different approaches to confiding. The second experiment [20] examined changes in immune functioning in response to confronting traumatic experience.

Approaches to confiding and illness visits

In the first of the two studies, 46 introductory psychology students were randomly assigned to one of our experimental conditions. One group (Control) wrote for 15 min each day for four consecutive days on assigned trivial topics such as descriptions of their living room, the shoes they wore, etc. The other three groups (labeled the trauma—fact, trauma—emotion, and trauma—combination groups) were asked to write about the most upsetting and traumatic experiences of their entire lives for each day. Those in the trauma—fact condition were asked to write about the facts surrounding the traumas that they chose to write about. We made it clear that subjects were not to write about their feelings. Those in the trauma—emotion condition wrote about their feelings and emotions surrounding the traumas but were told not to write about the actual traumatic events. Finally, the trauma—combination subjects wrote about both their feelings and the facts surrounding their traumas in each of the four sessions. Subjects could write about the same or different topics each day.

Subjects deposited their essays in a box after each session. We were careful to preserve complete anonymity and confidentiality. Each day, before and after writing, subjects completed a brief questionnaire pertaining to their health and moods. Four months after the experiment, subjects completed a follow-up questionnaire. Finally, six months after the experiment, we collected information about health center visits for illness, injury, and checkups. Frequency of visits were compared for the three months prior to the experiment with the six months after it.

We quickly learned that asking subjects to write about traumas is an extremely powerful paradigm for uncovering invisible and brutal aspects of life. This, and later experiments provide an insight into some of the terrible things that university students have endured. Several wrote about their drunken fathers beating their mothers or the subjects themselves. Reports of rape, molestation, and sexual traumas committed by brothers, fathers, step-fathers, and grandparents were not uncommon. One person wrote about not cleaning up his room when told to at age 10. That night, a grandparent visited, tripped on the living room, the shoes they wore, etc. Another person taught his sister how to sail who, on her first solo outing, drowned. We could recite horror story after story. Suffice it to say that we have been shocked by the readiness and depth of disclosure shown by our students.

Analyses of our results indicated that people in the trauma—combination and trauma—emotion conditions reported the greatest anxiety and depression each day after writing. In the follow-up questionnaires, however, these two groups reported being the happiest, healthiest, and least anxious. The trauma—facts and control groups appeared to be unaffected by the experiment in virtually all respects. Most interesting about this study were the results from the health center data before and after the experiment. Overall, subjects in the trauma—combination group evidenced a significant drop in illness visits after participating in the experiment compared to those in the other groups. These data, then, suggest that enforced confiding may have clear beneficial effects.

Confiding and the immune system

The next experiment along these lines was conducted with the help of Janice Kiecolt-Glaser and Ronald Glaser of Ohio State University Medical School [20]. We were interested in learning whether confiding traumatic experiences had a positive influence on immune function. In the study, which was quite similar to the one just described, 50 undergraduates were randomly assigned to one of only two conditions: control and trauma—combination. Subjects wrote about either trivial or traumatic experiences for four consecutive days, 20 min each day. Unlike the first study, we collected raw blood samples on the day prior to the beginning of the experiment, the last day after writing, and again six weeks later. Questionnaires, health center records, and autonomic data were also collected before, during, and after the experiment.

The blood samples were assayed in ways that assessed the body's natural immune response to mitogen stimulation using in vitro tests. Two common assays, based on the mitogens of PHA and ConA, measure the degree to which the immune system attacks foreign substances. Subjects in the trauma—combination cell showed a significant improvement in immune system functioning from the beginning to the end of the experiment, and these differences tended to persist six weeks later. Interestingly, we replicated our initial findings with health center records—those in the trauma—combination condition visited the health center for illness significantly less after the experiment than before compared to the control subjects.

Summary

Taken together, these data offer support that confiding about traumatic experience, although depressing in the short run, appears to have positive physical and psychological effects in the long run. At this point, we have demonstrated that disclosing early and recent traumas has positive physiological effects. Unfortunately, we have not yet provided compelling evidence that changes in inhibition underlie these biological effects.
Disclosure of traumas and psychosomatic processes

INHIBITION AND DISCLOSURE

As hypothesized earlier, the act of inhibiting ongoing behavior, emotions, and thoughts requires physiological work. A person who constantly thinks about something and wants to discuss it with others often actively holds back in talking about it. In our view, inhibition can be viewed as a source of stress that, over time, is cumulative and increases the probability of disease. Indeed, in the immune study discussed above, we found that those people who wrote about things that they reported wanting to have told others about (but had not done so) showed the most dramatic improvements in immune system functioning.

One problem with an inhibitory model is that it is difficult to directly tap inhibition. In the last few years, however, some promising developments in psychophysiology indicate that skin conductance levels (i.e. a measure of how much one's hands perspire) may reflect both short-term and long-term inhibition (for review of this literature, see [1, 21, 22]).

If skin conductance level, or SCL, taps or reflects inhibition, we should see changes in SCL as a function of individuals' disclosing traumatic topics. We would predict that the more traumatic the disclosure topic, the greater drop in SCL. As Fowles [1] has noted, other autonomic channels such as heart rate and blood pressure are not related to inhibition. Although we have now conducted several studies looking at autonomic activity and confiding, we briefly review two relatively similar ones conducted in our laboratory [23].

In the first study, 24 undergraduates were asked to talk into a microphone about the most traumatic experiences of their entire lives as well as to discuss their plans for the remainder of the day. Skin conductance, heart rate, and blood pressure were monitored once every 30-45 sec in an adjacent room. This was a rather unique study in that individuals sat alone in an eerie egg-carton covered room, illuminated by a dim purple light. Subjects talked into a cylindrical acoustic container equipped with a microphone so that no one outside of the room could hear what they said. As in the previous studies, we went to great lengths to assure confidentiality and anonymity.

As with the writing studies, talking about traumas resulted in major degrees of disclosure. One thing that became quickly apparent, however, was that some people would bare their souls and talk about extremely emotional topics whereas others disclosed fairly minor events in a matter-of-fact manner. Independent judges rated the tape recordings for degree of disclosure and, using a median split, we defined the two groups as high disclosers and low disclosers.

In general, high disclosers showed an overall lower level of skin conductance when talking about traumatic events than trivial events. Low disclosers, on the other hand, evidenced the opposite pattern—great relief when given the opportunity to discuss superficial issues. Blood pressure patterns were also interesting. Although only marginally significant ($P = 0.10$), both high and low disclosers evidenced blood pressure elevations while talking about profound topics in comparison to superficial ones. High disclosers also showed large drops in systolic blood pressure relative to their baseline levels after talking about profound topics.

A second, related study sought to learn whether talking about traumatic events into a microphone while alone in a room was different from talking to another person. In our father confessor study, 48 subjects were randomly assigned to talk either alone or to another person who was hidden from view behind a curtain. As in the first study, subjects talked about both profound and trivial topics in a counterbalanced way. Based on what subjects said in their talking about profound topics, judges' ratings were split so that half of the subjects were deemed high disclosers and the remainder low disclosers. As in the first experiment, when alone, high disclosers showed lower skin conductance levels when confronting traumatic topics than trivial ones. Low disclosers demonstrated the opposite pattern. Interestingly, the general pattern fell apart for subjects who were asked to talk about their traumas to an invisible psychology professor behind a curtain.

Overall, the autonomic results are intriguing but far from conclusive. They suggest that people who confront major psychological traumas evidence drops in skin conductance which, in our view, reflects a reduction in inhibition. Our next test, as you can guess, is to link talking about traumas and skin conductance levels with long-term health measures—a study that we have not yet conducted.

CONCLUSIONS AND IMPLICATIONS

The results are promising in suggesting that talking about or, in some way, confronting significant life experiences can be beneficial. Our discussion of supporting studies has, by definition, been brief without sufficient space for specifying some relevant boundary conditions. In the remainder of this paper, we point to some of the limitations and implications of our findings.

1. Based on internal analyses and interviews with subjects who participated in the studies, we believe that the act of disclosing is most beneficial for people who are constantly living with their traumas. A person who was jilted by a lover five years ago and still thinks about it every day would probably benefit from writing or talking about their emotions and experiences. A person who was jilted five years ago and never gave it a second thought, however, would not benefit from this exercise.

2. To whom a person discloses is undoubtedly important. Results from the father confessor study, for example, demonstrated that when individuals disclosed personal information to a person behind a curtain, their skin conductance levels were erratic. Clinical research with women who have been victims of incest point to the importance of the target of disclosure. Silver and her colleagues [24], for example, find that women who disclose their incest experiences and are later denounced by those to whom they confided evidence particularly long-term negative psychological and physical effects. All things being equal, the positive effects of disclosure are most likely to accrue if the target is viewed as both accepting and trustworthy.

3. We think that writing about or confronting
traumatic experiences is beneficial in that it helps the
person understand, resolve, and find meaning to the
experience. A number of clinical perspectives, ranging from Breuer and Freud’s [4] talking cure
to Roger’s [25] client-centered therapy to Meichen-
baum’s [10] cognitive-behavior therapy capitalize on
people’s abilities to assimilate significant events and
emotions in their lives. In addition, talking or writing
about traumas can promote adaptive psychological
responses to these memories by facilitating habituat-
ton or extinction (see also [9, 26]).

4. Perhaps most surprising from both a socio-
logical and psychological perspective is the simplicity
and power of the writing and talking paradigms that
we have employed. Because individuals disclose such
personal information—often about topics they have
never before disclosed—suggests the existence of a
general disclosure motive.

The natural impetus of disclosure could explain the
appeal of institutions which prescribe disclosure prac-
tices. These practices, for example, might take the
form of religious confessions or of public self-
criticisms. In the course of satisfying a basic human
motivation, however, institutionalized prescriptions
for disclosure may also serve a second gratifying
purpose: social integration. For example, pleading
guilty to wrongdoing within the family or even
judicial setting may force the individual to reconcile
ences. We have demonstrated that the disclosure of
personal information—often about topics they have
never before disclosed—suggests the existence of a
general disclosure motive.

Our research into the nature of disclosure and
inhibition has only begun. These nascent studies
point to the pervasiveness and fundamental processes
associated with our coping with significant life experi-
ences. We have demonstrated that the disclosure of
important personal events has physical and psycho-
logical benefits. We must now begin to explore in
greater depth the roles of inhibition and disclosure
within formal and informal social institutions and
across cultures.

Acknowledgements—Portions of this research have been
funded by grants from the National Science Foundation
(BNS86-06764) and the Heart, Lung, and Blood Institute of
the National Institute of Health (HL32547).

REFERENCES

1. Fowles D. C. The three arousal model: implications of
Gray’s two-factor theory for heart rate, electrodermal
activity, and psychopath. Psychophysiology 17,


1976.

4. Breuer J. and Freud S. Studies on Hysteria. Avon,

New York, 1943.

York, 1950.

7. Wolff H. G. Stress and Disease. Thomas. Springfield,
Ill., 1953.


10. Meichenbaum D. Cognitive-Behavior Modification: An

11. Holmes T. and Rahe R. The social readjustment rating

12. Rahe R. Life changes and near-future illness reports. In
Emotions: Their Parameters and Measurement (Edited by


14. Jourard S. M. Self-Disclosure. An Experimental Ana-

15. Freud S. Three essays on the theory of sexuality. In The
Complete Psychological Works (Edited by Strachey J.),

16. Pennebaker J. W. Traumatic experience and psycho-
somatic disease: exploring the roles of behavioral in-
hibition, obsession, and confiding. Can. Psychol. 26,
82–95, 1985.

17. Watson D. and Pennebaker J. W. Health complaints,
stress, and distress: exploring the central role of negative

18. Pennebaker J. W. and O’Heeron R. C. Confiding in
others and illness rate among spouses of suicide and
accidental death victims. J. Abnorm. Psychol. 93,

19. Pennebaker J. W. and Beall S. Confronting a traumatic
event: toward an understanding of inhibition and dis-

Disclosure of traumas and immune function: health
implications for psychotherapy. J. Consultg clin. Psy-
chol. In press.


22. Waid W. M. and Orne M. T. Reduced electrodermal
response to conflict, failure to inhibit dominant behav-
iors, and delinquent proneness. J. Person. soc. Psychol.
43, 769–774, 1982.

23. Pennebaker J. W., Hughes C. and O’Heeron R. C. The
psychophysiology of confession: linking inhibitory and
psychosomatic processes. J. Person. soc. Psychol. 52,

meaning in misfortune: making sense of incest. J. soc.

25. Rogers C. On Becoming a Person: A Therapist’s View of

26. Erdery M. H. Psychoanalysis: Freud’s Cognitive Psy-