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**The Mental and Physical Well-Being of
Formerly Depressed College Students:
A Preventive Intervention Study**

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**The Mental and Physical Well-Being of
Formerly Depressed College Students:
A Preventive Intervention Study**

By

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**The Mental and Physical Well-Being of
Formerly Depressed College Students:
A Preventive Intervention Study**

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This study examined the benefits of a therapeutic writing intervention (Pennebaker, 1989) in a depression-vulnerable student population. In applying the expressive writing paradigm to a depression-vulnerable population, the purpose of this study was twofold: (1) to determine the long-term therapeutic and preventive effects of expressive writing in formerly depressed college students over the course of 6 months and (2) to assess the therapeutic effectiveness of booster writing sessions 5 weeks after the initial writing intervention. Effects were assessed at a 5-week and 6-month follow-up. Ninety-seven undergraduate students who met the criteria of a past episode of mild to moderate depression were randomly assigned to either an experimental or control writing condition. The experimental group was instructed to write about their deepest thoughts and feelings on emotional upheavals, while the control group was instructed to write

objectively about how they manage their time. Each group wrote for 20 minutes on three consecutive days. Half of the participants in each group were randomly assigned to receive a booster session at the 5-week follow-up visit. Dependent variables included: (1) symptoms of depression (2) illness-related visits to a physician, (3) GPA, (4) self-reported physical symptoms and (5) measures of emotion-regulation. Participants who were in the expressive writing condition and received a booster session showed significantly greater declines in symptoms of depression than those in the expressive writing condition who had not received a booster session. Also, the expressive writing group displayed a tendency toward better physical health, as indicated by fewer illness-related physician visits, than the control group at the 5-week, but not the 6-month follow-up. In addition, participants who scored high on suppressive emotion-regulation strategies at the beginning of the study showed greater improvement in both depressive symptoms and rumination than participants who scored low on suppressive emotion-regulation strategies. Finally, participants in the expressive writing group reported that they both thought and talked more about their writing themes and were more willing to participate in the study again than control group participants. Overall, results suggest that Pennebaker's (1989) expressive writing intervention appears to have therapeutic and preventive effects in depression-vulnerable individuals.

Table of Contents

Chapter 1: Introduction	1
Chapter 2: Review of Literature	6
Cognitive Theories of Depression and Depression-Vulnerability	6
Cognitive and Emotion-Regulatory Phenomena in Depression-Vulnerability.....	9
Thought Suppression	9
Intrusion and Avoidance	11
Rumination.....	12
Emotional Dysregulation and its Consequences	13
Emotional Writing Disclosure – Theory and Research	15
Emotional Writing Disclosure and Mood Effects.....	17
Why is Writing about Emotional Topics Beneficial?	18
The Inhibitory Processes Model	19
The Cognitive Processes Model.....	20
The Emotion-Regulation Model	22
Emotional Writing and Depression-Vulnerable Individuals: A Preventive Application.....	25
Expressive Writing as a Preventive Intervention.....	25
Making Effects Last – Introducing Booster Sessions to the Writing Paradigm	27
Overview of Proposed Study	29
Research Aims and Hypotheses.....	29
Chapter 3: Methodology.....	32
Participants.....	32
Measures.....	32
Linguistic Manipulation Check.....	32
Measures of Mood	33
Measures of Emotion-Regulation	35
Measures of Physical Health, Academic Performance, and Stressful Life Events.....	36
Procedure	37
Pre-Testing and Initial Assessment (Time 1).....	37
Intervention	39
Five-Week Follow-Up (Time 2)	41
Six-Month Follow-up (Time 3)	42
Chapter 4: Results.....	43
Sample Characteristics.....	43
Manipulation Check.....	45
Test of Differences between Groups on Baseline Measures.....	47
Research Participants’ Subjective Experience at Time 3	48
Correlations among Study Variables Prior to Experimental Interventions	51
Examination of Hypotheses	54
Additional Exploratory Analyses.....	63

Benefits from Expressive Writing as a Function of Mental Control	63
Benefits from Expressive Writing as a Function of Other Factors	67
Chapter 5: Discussion	68
Review of Study Findings.....	68
Strengths of Current Study.....	76
Limitations of Current Study	78
Further Directions for Future Research	80
Conclusions and Clinical Applications of Study Findings	83
Appendices	86
References	115
Vita	124

Chapter 1: Introduction

Depression is a widely prevalent disease in the world today, debilitating millions of individuals. According to recent estimates, almost 20% of the US population will suffer from a depressive episode at one point in their lives (Gotlib & Hammen, 2002). The World Health Organization reports that depression is the number one cause of disability in the world, diminishing economical productivity and depleting health care resources. In 1990, major depression was considered the fourth most important disorder for the global burden of disease, and is projected to be the second most important disorder by the year 2020 (Murray & Lopez, 1996). In addition, depression has been linked to poor physical health, with increased cardiac problems and smoking rates in particular (Roy, Mitchell, & Wilhelm, 2001; Sullivan, LaCroix, Russo, & Walker, 2001). Furthermore, mood disorders are associated with high mortality. Up to 15% of individuals with severe Major Depressive Disorder die by suicide, accounting for up to 35% of all deaths by suicide (Angst, Angst, & Stassen, 1999).

Among those individuals who have recovered from depression, approximately 75% to 80% will have another depressive episode (Judd, 1997; Keller & Boland, 1998). In fact, the risk of subsequent depressive episodes increases with the number of previous episodes a person has had. Most individuals relapse within two years of recovery from a prior episode. Importantly, the strongest predictor of a current diagnosis of depression is a past depressive episode (Hammen, 1990). Hence a large number of formerly depressed

individuals are currently vulnerable to a depression relapse. The ultimate aim of this study is to explore the benefits of a preventive intervention with formerly depressed (and hence depression-vulnerable) individuals.

A plethora of research over the past decades has focused on psychological factors that contribute to depression-vulnerability. Cognitive diathesis-stress theories have proposed that latent schemata or attributional styles play a large role in depression-vulnerability (Beck, 1967, 1976; Abramson, Seligman, & Teasdale, 1978). These theories propose that schemata and attributional styles remain dormant once an individual is in remission from a depressive episode. When confronted with stress or negative life events, however, individuals who possess a relevant cognitive diathesis (or vulnerability) are more likely to experience a (repeated) depressive episode than people without this predisposition.

Maladaptive emotional self-regulation strategies such as thought suppression and rumination may contribute to the vulnerability of formerly depressed individuals (e.g., Abramson et al., 2002; Wenzlaff, 1993). These strategies can actually increase the incidence of depressive thoughts. In the case of thought suppression, once the person is struggling with a cognitively demanding or otherwise stressful situation, unwanted negative thoughts are prone to re-emerge into consciousness (Wegner & Smart, 1997), causing, in the worst of circumstances, a re-activation of negative affect. Rumination, which is defined as an inability to disengage from a self-focused cognitive loop and to find alternative solutions to problems, has been linked to vulnerability to depressed mood

and onsets of depressive episodes (Abramson et al., 2002; Nolen-Hoeksema & Morrow, 1991; Just & Alloy, 1997).

Individuals with a history of depression can be susceptible to multiple perils – high relapse rates, the utilization of counterproductive emotion regulation strategies, and endangered physical health are just a few. Although much focus in the empirical literature has been on effective interventions with currently depressed individuals (e.g., Beck, Rush, Shaw, & Emery, 1979), research on preventive interventions with vulnerable populations has increased over the past years. However, the fact that sophisticated interventions in a psychotherapeutic setting may not be accessible to many individuals who have a history of depression warrants empirical support for an effective, low -cost, easily accessible preventive intervention for depression-vulnerable individuals. This study seeks to utilize such an intervention, the expressive writing paradigm (Pennebaker, 1989), to examine its long-term physical and mental health benefits for a formerly depressed student population.

Written disclosure has produced remarkable therapeutic results in empirical studies over the past 15 years (Pennebaker, 1997; Smyth, 1998). Participants in the experimental condition are instructed to write about traumatic experiences for 15 to 20 minutes a day for 3 to 4 consecutive days, whereas control group participants are asked to write about superficial topics. Compared to control groups, participants in the experimental condition have made fewer physician visits for illnesses in the months following the intervention, have shown improved immune and hormonal functioning, and improved functioning in other biological markers of stress or disease. Behavioral

improvements include improved grade point average in college students and faster job re-acquisition in laid-off workers. Psychological benefits include reduced symptoms of depression, anxiety, and post-traumatic stress (Graf, 2004; Sloan & Marx, 2004a), the reduced impact of intrusive thoughts and memories (Lepore, 1997), as well as improved long-term mood (Smyth & Pennebaker, 2001). The benefits of writing have been replicated in multiple countries with diverse populations across ethnic groups, social classes, and personality types. The benefits of this simple writing intervention have even been compared to the benefits of short-term face-to-face psychotherapy (Esterling, L'Abate, Murray, & Pennebaker, 1999).

The act of writing about one's deepest thoughts and feelings could have multiple pathways of action for formerly depressed individuals. First, the intervention has been found to immediately reduce physiological work of inhibition, leading to improvement in physical health (Pennebaker, 1989). Inhibition is highly relevant to formerly depressed individuals, since they have been found to use inhibitory cognitive processes, such as thought suppression, to keep negative thoughts and feelings under control (e.g., Wenzlaff, 1993). Second, the act of translating emotional distress into language may bring about cognitive changes that allow a person to organize and simplify the experience, bring structure and meaning to it, and subsequently "move beyond" the emotionally adverse experience (Clark, 1993; Pennebaker & Seagal, 1999). In short, the writing process is beneficial because it provides a cognitive structure that helps assimilate unwanted experience into the individual's view of the self.

An unexplored facet of the therapeutic benefits of the writing paradigm is the utilization of booster sessions. Booster sessions have constituted an important part of treatment of depression as they are hypothesized to consolidate prior therapeutic gains in cognitive therapy of depression and depression-related phenomena (Beck et al., 1979). This study hopes to generate support for the use of booster sessions within the writing paradigm for a similar consolidating effect as in face-to-face interventions. It is expected that re-examining one's thoughts and feelings at a one-month follow-up booster session can reinforce and consolidate the initial gains of the intervention, fostering long-term maintenance of therapeutic effects.

In summary, this study seeks to examine a relatively simple, expedient, and low-cost procedure in a preventive context geared towards promoting long-term mental and physical health in formerly depressed participants. Should this intervention be effective to this end, it can be implemented and applied easily and at low cost in therapeutic and community outreach settings. More broadly, it is hoped that the proposed study will contribute to the field of depression prevention in vulnerable populations within the larger endeavor of ameliorating the impact of this disease.

Chapter 2: Review of Literature

Until the mid-1970's, the majority of theories that addressed the origin and treatment of depression were based on psychodynamic and behavioral literature. At that time, however, the research and writings of theorists such as Albert Ellis and Aaron Beck spawned what has been called the “cognitive revolution”. This revolution initiated a profound shift toward the conceptualization of depression from a cognitive and cognitive-behavioral perspective (Clark, 2001). One central hypothesis of the cognitive approach is that negative cognitions and systematic distortions of reality contribute to depression-vulnerability (Beck, Rush, Shaw, & Emery, 1979).

Cognitive Theories of Depression and Depression-Vulnerability

The primary conceptual assumption of cognitive theories of depression is that cognitive phenomena, such as negative cognitions, play a critical part in vulnerability, onset, and course of depression. To be reviewed in this section are the two most widely known models of depression - Beck's (1967) schema theory and the learned helplessness/hopelessness theory (Abramson, Metalsky, & Alloy, 1989).

Beck's (1967, 1976; Beck et al., 1979) approach proposes three phenomena central to the understanding of depression. The first is that depressed individuals hold negative beliefs about the self, the world, and the future, the so-called “cognitive triad”. All other symptoms of depression are considered a direct consequence of these negative beliefs. The second central concept is that depressed individuals possess negative cognitive schemata, which are displayed as dysfunctional beliefs and attitudes (Sacco &

Beck, 1995). Beck et al. (1979) define a schema as a “relatively stable cognitive pattern that forms the basis for the regularity of interpretations of a particular set of situations” (p.12). These schemata constitute a vulnerability in that they are dormant cognitive structures until they are activated by stressful events in the environment that resemble circumstances around which the schemata originated (e.g., loss, rejection, failure). Once activated, schemata guide the processing of self-relevant information in a schema-congruent fashion. The third central concept constitutes distortions of reality by depressed individuals. These distortions result from filtering incoming information through primitive schemata. Some of these distortions include dichotomous thinking, overgeneralizing, and catastrophizing about the outcomes of events (Beck et al., 1979). These negative distortions, in turn, cause negative affect as well as behavioral, motivational, and vegetative symptoms of depression.

The learned helplessness/hopelessness theory of depression began with Seligman’s (1975) suggestion that depression is a function of a learned non-contingency between responding and reinforcement (“learned helplessness”). Abramson, Seligman, and Teasdale (1978) added an attributional component to this theory, proposing that individuals who made stable, global, and internal attributions for helplessness-inducing events were most likely to become depressed. After further investigations, Abramson, Metalsky, & Alloy (1989) presented yet another reformulation of the theory, stating that hopelessness, not helplessness, is a sufficient cause for depressive symptoms, or so-called “hopelessness depression.” Hopelessness symptoms occur when individuals anticipate that outcomes will constantly be unrelated to their behavior. A negatively biased

attributional style (stable, global, internal) was specified as a vulnerability factor for depression in this revised theory. The kinds of attributions individuals make for negative life events as well as the degree of importance they attach to them contribute to the development of hopelessness and the symptoms of depression.

The helplessness/hopelessness theory of depression and Beck's cognitive theory have evolved to a point where they closely resemble each other. For example, helplessness and hopelessness relate closely to the negative view of the world and the future (Shaw & Katz, 1990). Furthermore, both theories are considered diathesis-stress theories of depression, in that they maintain that negative cognitive patterns contribute to people's vulnerability to depression when they are confronted with negative life events (Abramson et al., 2002). While the cognitive diathesis, or vulnerability factor, is considered to be a latent depressotypic schema in Beck's theory, it is conceived to be a negative attributional style in the hopelessness formulation (Abramson, Alloy, & Metalsky, 1988). When confronted with stress or negative life events, people who hold a relevant cognitive diathesis (i.e. latent negative schemata or attributional styles) are more likely to experience a depressive episode than people without this predisposition. Like most diatheses-stress models, these two theories assume the diathesis to be stable in depression-vulnerable individuals' mental structures, regardless of whether the individual is symptomatic or asymptomatic.

The Cognitive Vulnerability to Depression Project (CVD) (Abramson et al., 1999; Alloy, Abramson et al., 1999; Alloy et al., 2000) provides compelling support for the cognitive diathesis-stress theories of depression. First-year college students were divided

into cognitively high risk and low risk groups according to their scores on cognitive vulnerabilities measures (Cognitive Style Questionnaire; Abramson, Metalsky, & Alloy, 2000 and Dysfunctional Attitude Scale; Weissman & Beck, 1978). Participants were followed over 2.5 years with self-report and structured interview assessments every 6 weeks. As hypothesized, high risk participants showed a greater lifetime prevalence of Major and Minor Depressive Disorder in the retrospective design and showed a greater likelihood than low risk participants of a *first onset* of Major and Minor Depressive Disorder during the initial 2.5 year prospective follow-up. In addition, among participants with prior episodes of depression, the high risk group also showed a greater likelihood for relapse than the low-risk group at the follow-up. These findings are especially crucial as they hold up the cognitive vulnerability hypothesis not only for the onset of depression, but for recurrences of depression as well.

Cognitive and Emotion-Regulatory Phenomena in Depression-Vulnerability

Besides the factors described in the cognitive diathesis-stress theories of depression, several additional cognitive phenomena have been linked to negative mood, depression, and depression-vulnerability. Some researchers found that depression-vulnerable individuals in particular are prone to certain attentional and cognitive processes (e.g., Abramson et al., 2002; Brewin, Reynolds, & Tata, 1999; Rude & McCarthy, 2003; Wenzlaff, 1993). Classic examples of these mental occurrences are thought suppression, intrusion and avoidance, and rumination.

Thought Suppression. Research on mood control strategies suggests that formerly depressed individuals are actively trying to suppress and inhibit dysfunctional negative

thoughts in order to control their mood and prevent a relapse into depression. Negative schemata are thus not “inactive” per se, but rather kept “in check” through mental control. This process of thought suppression requires considerable cognitive resources and is prone to fail in the presence of competing cognitive strains (Wegner, 1994; Wenzlaff, 1993; Wegner & Wenzlaff, 1996).

In experimental research, negative processing bias in thought-suppressing depression-vulnerable individuals has been detected through the introduction of a cognitive load (i.e., memory task) that is presumed to interrupt the thought suppression process (Rude, Valdez, Odom, & Ebrahimi, 2003; Rude, Wenzlaff, Gibbs, Vane, & Whitney, 2002; Wenzlaff & Bates, 1998; Wenzlaff & Eisenberg, 2001; Wenzlaff, Rude, Taylor, Stultz, & Sweatt, 2001). These studies indicate that formerly depressed individuals are able to suppress negative responses and substitute more positive interpretations when given the chance to do so. However, when formerly depressed individuals are taxed by time pressures and situations that demand cognitive capacity, their mental control strategies can be undermined, enabling negative tendencies to take hold.

The suppression of emotionally-laden thoughts has furthermore been an important component in psychosomatic models of disease. In particular, thought suppression practices have been linked to increased physiological activity, increased susceptibility to disease, and compromised immune functioning (Petrie, Booth, & Pennebaker, 1998). In consideration of this evidence, it is important to address and attempt to remedy thought

suppression strategies in preventive interventions, as they can represent a crucial vulnerability factor to depression and physical illness.

Intrusion and Avoidance. Intrusive thoughts and mental strategies to avoid them are common symptoms of post-traumatic stress disorder (American Psychiatric Association, 1994). Recent empirical evidence, however, has established that intrusion and avoidance of memories of stressful past events are also a widely occurring phenomenon within depression (Brewin et al., 1999; Spenceley & Jerrom, 1997). In fact, in a follow-up study of clinically depressed patients by Brewin and colleagues (1999), intrusion and avoidance of stressful memories were found to predict depression at a 6-month follow-up, even after initial depression symptoms were taken into account. Another striking and relevant finding is that intrusion and avoidance have been shown to moderate the relationship between traumatic experiences and the onset of depression and physical illness (Lepore, 1997; Lepore & Greenberg, 2002). That is, individuals who exhibit a higher rate of intrusion and avoidance symptoms about a past emotional upheaval have a higher incidence of depressive symptoms or upper respiratory infections at a later point in time.

Formerly depressed individuals also display intrusion and avoidance patterns. Spenceley and Jerrom (1997) compared intrusion and avoidance symptoms of traumatic childhood memories among depressed, remitted, and never depressed women. They found that women who were in remission from depression had normal levels of intrusive memories, but significantly higher levels of avoidance symptoms compared to never depressed women.

Considering the empirically established link between negative life events and depression, it is highly probable that formerly depressed individuals have a high number of traumatic and threatening memories (c.f., Spenceley & Jerrom, 1997). It seems that traumatic memories lose their intrusive impact once depression remits, but remain easily accessible within the person's memory. In order to evade relapse, remitted patients expend cognitive resources to avoid the re-activation of distressing memories (Brewin et al., 1999; Wenzlaff, 1993). These avoidance phenomena could in turn be linked to thought suppression practices. Since persistent intrusion and avoidance symptoms indicate both inhibition and incomplete or unsuccessful cognitive processing (Lumley, Tojek, & Macklem, 2002; Lepore & Greenberg, 2002), a helpful strategy in the prevention of future depressive episodes with remitted patients would be to utilize an intervention that will promote cognitive processing of adverse events and consequently reduce accessibility to the cognitive structures that contain the respective memories.

Rumination. In her seminal work on ruminative processes, Susan Nolen-Hoeksema (1991) defined rumination as a process of perseverative attention directed to specific (often internal) content. Rumination has been linked to longer and more severe episodes of depressed mood, distorted and pessimistic thinking, and inhibition of constructive coping skills (Nolen-Hoeksema, 1998). Once a person has entered the depressive state, rumination may involve rigid attention on an individual's negative mood and its causes and consequences. This excessive focus on negativity in turn perpetuates the depressive mindset.

Abramson and colleagues (2002) propose that cognitive vulnerability to depression is closely linked to a ruminative response style to negative events. They suggest that following a negative life event, depression-vulnerable individuals tend to plunge into a ruminative checking process to evaluate the undesired or unexpected situation. Whereas non-vulnerable individuals are able to disengage from this checking process, depression-vulnerable individuals get stuck ruminating about the negative content of the event. This so-called “sticky attention” causes negative affect, high self-focus, poor concentration, somatic preoccupation, and insomnia, just to name a few (c.f., Pyszczynski & Greenberg, 1987).

Empirical evidence has supported the link between rumination and depression-vulnerability. A prospective study of college students by Just and Alloy (1997) found that ruminative response styles increased the chances of a nondepressed individual experiencing a depressive episode over 18 months after recruitment, and that rumination increased the severity of the episode. Therefore, a ruminative response style may constitute a significant risk factor for future onsets of depression. Hence, an intervention that combats ruminative style by restructuring the cognitive representation of an event and breaking its associated “sticky attention” would be expected to contribute to a possible prevention of the onset of future depressive episodes.

Emotional Dysregulation and its Consequences. As reviewed above, a plethora of empirical evidence links the phenomena of thought suppression, intrusion and avoidance symptoms, and a ruminative cognitive style to depression-vulnerability. These phenomena can be scrutinized from the perspective of emotion regulation, in that each

involves processes that influence the quality, frequency, and intensity of emotional responses. These emotion-regulation processes are not necessarily controlled or conscious (Lepore, Greenberg, Bruno, & Smyth, 2002). Emotions can be optimally regulated (in the rare occasion of perfect mental health), under-regulated, or over-regulated. Dysregulated emotions, in turn, place individuals at an increased risk for physical and psychological health problems (Lepore et al., 2002).

As described above, depression has been linked to both over-and under-regulatory phenomena, such as suppression, avoidance, intrusion, and rumination. Some researchers argue that depression-vulnerable individuals, in general, are more prone to over-regulating their emotions through strategies such as thought suppression and avoidance rather than under-regulating their emotions (Wegner, 1994; Wegner & Wenzlaff, 1996). Nevertheless, the very tendency to engage in over-regulation practices can ironically give rise to emotional under-regulation, as well. To succeed in emotional over-regulation, such as inhibition and avoidance, the person must engage in two simultaneous processes: he or she must (1) constantly stay alert to mental cues that are associated with negative emotions (so that these can be immediately suppressed) and (2) look for positive distracters to steer away from negative cognitions (Wegner, 1994). For a depression-vulnerable person who already has an extensive negative thought network, the processes of inhibition and monitoring can be particularly demanding. If cognitive resources are limited due to stressful situations, competing cognitive tasks, substance use, or other deficiencies, these mood control strategies will tend to be less efficient, causing a rebound in negative thinking (Bevers, Wenzlaff, Hayes, & Scott, 1999). Especially those

individuals who habitually employ a high rate of inhibitory strategies display a particularly pronounced rebound (Wenzlaff & Bates, 1998; Wenzlaff et al., 2001). That is, the more a person tries to suppress unwanted thoughts, the more frequently these thoughts will rebound. Consequently, habitual emotional over-control can under certain circumstances ironically promote occasional lapses in control, leading to paradoxical rebound of the very emotion that was being suppressed.

Stephen Lepore and his colleagues (2002) outlined the health consequences of emotional over- and under-regulation, respectively. Excessive emotional control has been linked to cancer, chronic sympathetic activation, compromised immune system functioning, and cardiovascular disorders, such as chronic high blood pressure (c.f., Petrie et al., 1998). Emotional under-control, on the other hand, has been tied to exaggerated physiological arousal, coronary artery disease, asthma, arthritis, as well as increased infectious illnesses. One especially critical aspect of emotional under-regulation is that physiological systems involved in emotions are chronically activated, leading to long-term cumulative damage and wear and tear in these systems. Because depression-vulnerable individuals are susceptible to both emotional under- and over-control, they are at an increased risk of ill health effects over time.

Emotional Writing Disclosure – Theory and Research

Most psychotherapeutic approaches are centered around the identification, organization, and expression of stress- and trauma-related thoughts and feelings. Early theories of psychological change (Breuer & Freud, 1895/1966; Janet 1919) emphasized the adverse effects of non-disclosure of emotionally upsetting materials on mind and

body. An essential therapeutic component in these theories was the mere act of disclosing previously unspoken, unconscious material. The process of recovering original traumatic memories from the unconscious and organizing them into a cohesive spoken narrative was believed to reverse the unwanted effects of keeping unpleasant memories repressed.

Over the past decade, interest in the therapeutic effects of *written disclosure* has risen dramatically. Numerous studies have found that writing about one's deepest thoughts and feelings around emotional upheavals, along with creating a cohesive story about these events, can have tremendous effects on a person's mental and physical health (Pennebaker, 1997; Pennebaker & Seagal, 1999). The benefits of writing have even been compared to the benefits of psychotherapy (L'Abate, 1991; Esterling, L'Abate, Murray, & Pennebaker, 1999). Lepore and Smyth (2002) ascribe the recent surge of applications of the writing intervention to three causes: (1) Empirical support for the therapeutic benefits of expressive writing has been consistent, (2) expressive writing is a low-cost treatment that is highly sought after in today's world of managed health care and cost controls, and (3) writing provides an opportunity to express thoughts and feelings that may otherwise not be expressed due to social constraints, inhibited mobility, lack of access to services, or other personal inhibitions.

The expressive writing paradigm has produced remarkable therapeutic results which have been replicated across many diverse populations in multiple countries (for a review, see Pennebaker, 1997; Smyth, 1998). The procedure of expressive writing usually unfolds as follows: Participants in the experimental condition are asked to write

about traumatic experiences for 15 to 20 minutes a day for 3 to 4 consecutive days, whereas control group participants are asked to write about superficial topics, such as time management. Compared to the control groups, participants in the experimental condition have made fewer physician visits for illnesses in the months following the intervention (e.g., Pennebaker & Beal, 1986; Pennebaker, Mayne, & Francis, 1997), have shown improved immune and hormonal functioning (e.g., Booth, Petrie, & Pennebaker, 1997; Pennebaker, Kiecolt-Glaser, & Glaser, 1988), and improved functioning in other biological markers of stress or disease (e.g., Francis & Pennebaker, 1992; Petrie, Booth, Pennebaker, Davison, & Thomas, 1995). Behavioral enhancements through the writing paradigm include improved grade point average in college students (e.g., Lumley & Provenzano, 2003; Pennebaker, Mayne, & Francis, 1997), absenteeism from work (Francis & Pennebaker, 1992), and faster job re-acquisition in laid-off workers (Spera, Buhrfeind, & Pennebaker, 1994).

Emotional Writing Disclosure and Mood Effects

Overall, the studies of the effects of written disclosure on mood have produced mixed findings (for a review, see Sloan & Marx, 2004b; Smyth & Pennebaker, 2001). Sloan and Marx (2004b) point out that investigators have varied widely on their use of mood assessments, with some using single-question measures or measures with undocumented psychometric properties. In addition, studies have also employed wide variations of the original Pennebaker writing paradigm methodology. These and other methodological issues could account for some of the mixed findings.

Nevertheless, some studies have shown that expressive writing can counteract symptoms of depression. L'Abate, Boyce, Fraizer, and Russ (1992) found that a programmed, workbook-based writing lowered depression scores on the Beck Depression Inventory for severely and moderately depressed participants alike. However, the less-structured, non-workbook-based expressive writing paradigm, in which participants simply write about current or past emotional upheavals, has also produced improvement in distress, negative moods, and depression (Murray & Segal, 1994; Smyth & Pennebaker, 2001).

Sloan and Marx (2004a) recently found that, compared to control participants, written disclosure lowered both depression scores on the Beck Depression Inventory and post-traumatic stress symptoms in female participants who met criteria for Post-Traumatic Stress Disorder. Participants in the experimental group of this study furthermore reported fewer physical complaints and fewer days sick at follow-up compared to control participants. In addition, Graf (2004) found that outpatient psychotherapy patients who completed two written disclosure homework exercises displayed significantly greater declines in symptoms of depression and anxiety as measured by the Depression Anxiety Stress Scales than the control group.

Why is Writing about Emotional Topics Beneficial?

Several theoretical models have attempted to explain the widely replicated beneficial impact of the expressive writing paradigm. Early models proposed by Pennebaker include the inhibitory processes model and the cognitive processes model. More recently, Lepore and colleagues (2002) suggested that expressive writing improves

emotion-regulation processes and helps individuals strike a balance between emotional over- and under-control. Each of these models shall be briefly reviewed below.

The Inhibitory Processes Model. The inhibitory processes model (Pennebaker, 1989; 1997) suggests that in order to cope with some of life's negative experiences, such as a previous episode of depression or trauma, individuals actively inhibit their thoughts, feelings, and behaviors associated with these experiences. This work of inhibition serves as a cumulative stressor on mind, body, and information-processing, so that individuals are hindered from effectively processing the negative experience. In addition, the long-term work of inhibition may exacerbate psychosomatic processes, which can ultimately lead to increased occurrences of illness and stress-related wear and tear on the body. The act of confronting the experience through writing has been found to counteract the mental and physical work of inhibition. Writing about previously inhibited material has been shown to improve mental and physical health, to help the individual understand and ultimately assimilate an event, and to immediately reduce physiological work of inhibition. For example, after written disclosure, participants exhibited a reduction in classic physiological markers of inhibition: blood pressure, muscle tension, and skin conductance (Pennebaker, 1989).

This model sheds light on why depression-vulnerable individuals could benefit from the expressive writing paradigm. Cognitively at-risk people demonstrate multiple inhibitory strategies, such as thought suppression and avoidance. The disinhibitory process of assigning words to previously undisclosed thoughts and feelings may disengage mood control strategies such as thought suppression. Indeed, empirical

evidence supports that thought suppression becomes increasingly challenging for participants who are asked to write about their most emotional personal experience (Beevers et al., 1999; Petrie et al., 1998).

The Cognitive Processes Model. The cognitive processes model (Pennebaker, 1989; 1997) proposes that the act of translating emotional distress into language brings about cognitive changes that allow a person to organize and simplify the experience and bring structure and meaning to it. This ultimately allows the person to move beyond the emotional upheaval (Pennebaker, 1997; see also Clark, 1993). That is, the mere expression about negative life events is not enough – what brings about the positive effects of writing is rather the act of creating a cohesive narrative through language that allows the person to view the experience in a different light. Whereas a lack of narrative and cognitive structure may promote the continued re-emergence of negative thoughts and feelings, constructing a meaningful story around the experience can offset rumination and create meaning (Pennebaker & Segal, 1999). In other words, the writing process is beneficial because it provides a cognitive structure that helps assimilate unwanted experience into the individual's view of the self. Consistent with this notion, two-thirds of participants in the emotional writing conditions indicated that the process was highly meaningful and caused them to understand themselves better (Pennebaker, 1989).

Empirical evidence supports the cognitive processes model. For example, Smyth, True, and Souto (2001) randomly assigned participants to either write a detailed narrative about a traumatic event, a fragmented list describing the trauma, or a control topic. Participants who formed a cohesive narrative showed the most behavioral health benefits,

suggesting that creating a cohesive story may be a necessary condition to experience the health benefits of emotional writing. Using a different approach to assess cognitive processes in writing, Pennebaker, Mayne, and Francis (1997) analyzed language variables in emotional writing studies as predictors of subsequent health. They found that those participants who increased their words associated with causal and insightful thinking throughout their essays showed the most improvements in health. More recently, Campbell and Pennebaker (2003) found that cognitive flexibility can also be a mediator of positive health outcomes. In re-analyzing emotionally expressive essays, the authors found that flexibility in the use of common words, such as personal pronouns (e.g., I, you, he, she, they, me, my, his, her, their), was consistently associated with subsequent good health. These findings suggest that cognitive change and flexibility play an important role in mediating the positive outcomes of emotional writing procedures.

In sum, writing about emotional upheavals seems to promote a person's ability to gain insight into events, allowing the person to psychologically complete the experience and move on. In depression-vulnerable individuals, such a cognitive change may help reduce the effects of emotional inhibition and help to identify, process, and reorganize unwanted cognitions and emotions. If the writing task is targeted at disclosing previously inhibited and unwanted thoughts, it can help assimilate the unwanted experience into the at-risk individual's view of self, provide a cognitive structure for these thoughts, and reduce rumination (Pennebaker, 1997).

Creating a coherent and significant story about one's self can furthermore serve as a substantial foundation for generating meaning for one's experience. In this notion,

Edward Bruner (1986) perceived the disclosure-narrative process as a “meaning-generating interpretive device which frames the present within a hypothetical past and an anticipated future” (p.18). These re-structuring and meaning-making mechanisms are important because they could possibly prevent a future depressive episode by assimilating unwanted and suppressed experiences.

The Emotion-Regulation Model. Stephen Lepore and colleagues (2002) proposed that expressive writing facilitates healthy emotion regulation through three regulatory mechanisms: (1) directing attention, (2) promoting habituation, and (3) providing cognitive restructuring.

First, writing about one’s deepest thoughts and feelings about emotional upheavals can direct attention to the source of the upheaval and its associated negative consequences. Focusing on multiple aspects of a stressful event leads to increased expression of emotion (particularly negative emotion) and steers away from avoidance or over-regulation strategies for these emotions (Smyth, 1998). Especially those individuals who tend to habitually over-regulate emotions, such as depression-vulnerable individuals, are likely to benefit from focusing on and confronting negative thoughts and emotions (Lumley et al., 2002; Stanton & Danoff-Burg, 2002).

Second, the authors suggest that increased attention to negative thoughts and feelings leads to habituation, which in turn reduces negative emotional responses to stressors. Habituation, in this case, is defined as a decreased response to repeated stimulation. The authors suggest that since participants in the expressive writing paradigm are asked to write about the same stressful event for three to four consecutive

days, the repeated exposure to the stressful event promotes desensitization to negative emotional associations and reactions.

Several studies support the notion that habituation is an important mediator in the effects of writing. For example, Petrie and colleagues (1995) found that skin conductance level, a physiological indicator of autonomic arousal, declined steadily over the writing days for the experimental writing group, but not for the control group. Sloan and Marx (2004a) uncovered that physiological activation during the first written disclosure session was linked to reduced psychological symptoms after writing was completed. Similarly, Lepore (1997) found that participants who write about their deepest thoughts and feelings about an upcoming stressful graduate entrance exam also become desensitized to intrusive thoughts about the event. However, emotional expressiveness, especially that of negative emotions, seems to be a necessary and crucial factor in habituation. In accordance, expressing more negative emotions over the course of writing has been associated with more pronounced improvements in health (Pennebaker, Mayne, & Francis, 1997) and expressing more emotions overall has been associated with better immune functioning (Esterling, Antoni, Fletcher, & Margulies, 1994).

The third component of the Emotion-Regulation Model, cognitive re-structuring, adopts its main components from Pennebaker's (1997) Cognitive Processes Model. Lepore and colleagues (2002) propose that expressive writing can promote changes in how people think about and evaluate their stressors or emotional upheavals. The authors believe that besides looking at components in essays that indicate increased

understanding and insight over time (c.f., Pennebaker et al., 1997), examining the frequency and impact of intrusive thoughts is another way of assessing the occurrence of cognitive restructuring. They propose that intrusions are evidence of the mind struggling to assimilate traumatic events within pre-existing mental schemas. In fact, several studies demonstrated that expressive writing can reduce both the frequency and impact of intrusive thoughts in individuals who wrote both prospectively and retrospectively about traumatic and stressful experiences (Lepore, 1997; Lepore & Greenberg, 2002; Schoutrop, 2000).

In addition to the importance of cognitive processing, Lepore and colleagues (2002) underline the importance of incorporating feelings into the narrative. Writing about feelings may promote awareness, acceptance, and integration of emotions into one's self-concept. Expressive writing about both thoughts and feelings can not only provide cognitive and emotional clarity, but a sense of mastery as individuals become accustomed and more tolerant of their thoughts and feelings throughout the writing process.

In conclusion, the Emotion-Regulation Model supplies a useful framework of the impact of expressive writing on emotion-regulation processes. The three mechanisms of attention, habituation, and cognitive processing can explain many research results within the realm of the writing paradigm. On the other hand, the Emotion-Regulation Model seems to also incorporate earlier theories of Pennebaker (1989; 1997) within the framework of emotional response tendencies and self-regulation. As emotion-regulation processes play a large role in depression and depression-vulnerability, this framework can

be helpful in explaining possible positive effects of expressive writing with these populations. It is plausible that cognitive phenomena in depression-vulnerable individuals may be differentially combated by attention, habituation, and cognitive processing within the writing paradigm. Whereas mental control strategies such as thought suppression and avoidance may be specifically confronted by attention and habituation processes, ruminatory phenomena may respond better to the cognitive processing component in expressive writing. It remains to be empirically tested which of the three components of the Emotion-Regulation Model is most crucial for certain populations.

Emotional Writing and Depression-Vulnerable Individuals: A Preventive Application

Currently, most mental health resources are allocated to the treatment of mental illness. However, the treatments that are in place tend to reach only very few of those who need them. For example, only 22% of non-Hispanic whites and only 11% of Mexican Americans who meet the criteria for a Major Depressive Episode receive mental health treatment (Muñoz, Le, Clarke, & Jaycox, 2002). Most of those who receive treatment do not adhere to it, and of those who do, only two-thirds experience significant improvement (Depression Guideline Panel, 1993). Considering these statistics, as well as the highly recurrent nature of depression, preventing new episodes of major depression, or more ideally, the first episode, is essential.

Expressive Writing as a Preventive Intervention

Although intervention research with depressed populations has in general been favored over prevention research, several randomized trials have examined the effects of

preventive interventions on future onsets of depression (for reviews, see Morin & Chalfoun, 2003; Muñoz et al., 2002). Commonly used interventions range from cognitive restructuring, cognitive-behavioral skills, family interventions, and social problem resolution to stress-combating and relaxation techniques, psychoeducational group interventions, coping skills interventions, and support groups. Most of these interventions involve group formats and vary in number of sessions. In general, depression prevention studies with participants who do not meet criteria for a major depressive episode upon entry into the study demonstrate positive effects. However, sophisticated preventive interventions that stretch over multiple meetings and several weeks may not be accessible or feasible to many individuals who have a history of depression. As mentioned above, many available treatment modalities never reach those individuals who are in need of them – reasons include lack of outreach efforts to all affected populations, lack of time and resources to attend treatments, or even a lack of knowledge about the necessity of treatments, considering that many individuals with a history of depression may have never been diagnosed (c.f., Gotlib & Hammen, 2002). What is lacking in the current literature is an empirical effort for an effective, low-cost, easily accessible preventive intervention for depression-vulnerable individuals.

The expressive writing paradigm has produced clinically meaningful results for both mental and physical health across a variety of populations (Smyth, 1998). In addition, writing is a cost-effective, mass-oriented approach that can be used as an intervention in itself or as an adjunct to face-to-face therapeutic interventions. While past studies have examined the short- and long-term mood effects of the writing

paradigm in non-clinical populations (Smyth & Pennebaker, 2001), its use as a preventive intervention with formerly depressed, currently remitted participants is uninvestigated.

Past research on the writing paradigm indicates that expressive writing shows strong potential to combat multiple perils and phenomena of depression-vulnerability. As reviewed above, theoretical models (Pennebaker, 1989; 1997; Lepore et al., 2002) and numerous studies suggest that writing promotes healthy emotion-regulation and cognitive restructuring, eliminates rumination, and counteracts inhibitory strategies such as thought suppression and avoidance. Furthermore, expressive writing has been specifically shown to moderate the relationship between intrusive thoughts and the onset of depressive symptoms (Lepore, 1997).

Making Effects Last – Introducing Booster Sessions to the Writing Paradigm

When considering preventive and prospective research designs, the question arises of how long the effects of an intervention will last. In general, follow-up studies show that treatment gains tend to deteriorate with the passage of time. With regards to depression treatment studies, most of which are based on the cognitive-behavioral paradigm, the most common approach to reduce depression recurrence after treatment interventions is to add “booster” sessions at an increasingly reduced frequency after the termination of the acute treatment phase (Clarke, Rohde, Lewinsohn, Hops, & Seeley, 1998). The purpose of booster sessions is to consolidate prior treatment gains and provide the opportunity to apply such gains to possibly new stressful situations that have arisen between the acute treatment phase and the booster session (Beck et al., 1979). Several studies have found significant booster session effects for the maintenance of

psychotherapeutic gains of cognitive-behavioral interventions in adults and adolescents (e.g., Clarke et al., 1998; Riedel, Fenwick, & Jillings, 1986).

The treatment gains of expressive writing show varying robustness. The positive physical health effects of writing have been demonstrated to be relatively long-lasting. Reduction in visits to the physician for the experimental writing group have been demonstrated to last 2 months, 6 months, and up to 1.4 years after the writing intervention (Pennebaker, 1997). Unfortunately, positive effects on self-reported mood have been less robust over time. For example, L'Abate and Baggett (1997) found that the positive effects of writing on depressed mood (as measured by the Beck Depression Inventory and Center for Epidemiological Studies – Depression) had diminished after 6 months.

The utilization of booster sessions within the expressive writing paradigm has not been empirically explored. It is possible that the written re-examination of thoughts and feelings after the passage of time may produce a similar consolidating effect as has been shown for face-to-face interventions. In addition, written re-examination of a certain stressful event may strengthen and reinforce a healthy psychological distance to the event. This consolidation and strengthening of initial treatment gains may be particularly crucial for an at-risk population receiving a preventive intervention – a population for whom prolonging initial prevention gains may be especially essential.

Overview of Proposed Study

This study seeks to evaluate the therapeutic and preventive effects of the expressive writing paradigm (Pennebaker, 1989) with formerly depressed, currently remitted participants. Undergraduate students in the Department of Psychology at the University of Texas at Austin who meet the criteria of a past episode of mild to moderate depression were recruited and randomly assigned to either treatment or control writing conditions. The experimental group was instructed to write about their deepest thoughts and feelings on current and past emotional upheavals, while the control group was instructed to write about a neutral topic (i.e., time management, a commonly used control condition in expressive writing studies with the college population). Writing took place on three consecutive days for 20 minutes. In addition, the proposed study aimed to examine the consolidating effects of a booster writing session after five weeks. Half of the participants in the experimental group and half of the participants in the control group were randomly assigned to receive a booster session five weeks after the initial writing phase.

Research Aims and Hypotheses

The aim of this study was twofold: (1) to determine the therapeutic and preventive effects of expressive writing in formerly depressed college students and (2) to assess the therapeutic effectiveness of booster writing sessions. The study consisted of four phases: Pre-testing; Time 1 (initial assessment and writing intervention); Time 2 (5-week follow-up and booster session); and Time 3 (6-month follow-up). Dependent

variables of interest were depression scores, emotion-regulation measures, visits to a physician, and academic performance. The following hypotheses are proposed:

Hypothesis 1: Participants in the expressive writing condition will display lower depression scores at the 5-week and 6-month follow-ups than participants in the control writing condition. Participants in the expressive writing condition who receive an additional booster session at 5-week follow-up are expected to score lower depression scores at the 6-month follow-up than those participants in the expressive writing condition who do not receive a booster session.

Hypothesis 2: Participants in the expressive writing condition will display lower rumination and suppression scores and higher scores in reappraisal and emotional approaches to coping at the 5-week and 6-month follow-ups than participants in the control writing condition. Participants in the expressive writing condition who receive an additional booster session at 5-week follow-up are expected to exhibit lower rumination and suppression scores and higher scores in reappraisal and emotional approaches to coping at the 6-month follow-up than those participants in the expressive writing condition who do not receive a booster session.

Hypothesis 3: Participants in the expressive writing condition will have fewer physical illness-related visits to a physician as well as fewer self-reported physical symptoms at the 5-week and 6-month follow-ups than participants in the control writing condition. Participants in the expressive writing condition who receive an additional booster session at the 5-week follow-up are expected to have made fewer physician visits

and report fewer physical symptoms at the 6-month follow-up than those participants in the expressive writing condition who do not receive a booster session.

Hypothesis 4: Participants in the expressive writing condition will display better academic performance, as indicated by a higher grade point average, at the 6-month follow-up (second semester post-writing) than participants in the control writing condition. Due to previous findings in college student samples (e.g., Pennebaker, Colder, & Sharp, 1990), it can be expected that no significant differences are found at the 1-month follow-up (first semester post-writing). Participants in the expressive writing condition who receive an additional booster session at the 5-week follow-up are expected to exhibit better academic performance at the 6-month follow-up than those participants in the expressive writing condition who do not receive a booster session.

Chapter 3: Methodology

Participants

Ninety-seven undergraduate students (70 women and 27 men) from the Department of Psychology at the University of Texas at Austin participated in the study. All 97 participants completed their three writing sessions and returned at the 5-week follow-up (Time 2). Ninety-two participants (94.8 %) returned at the 6-month follow-up (Time 3). Of the five participants that dropped out of the study, four were in the experimental condition, and one was in the control condition. Participants who completed the pre-testing, the intervention, and the 5-week follow-up received class credit. They were paid \$10 for their participation at the 6-month follow-up.

Measures

Linguistic Manipulation Check

Linguistic Inquiry and Word Count (LIWC; Pennebaker, Francis, & Booth, 2001). To test whether the writing intervention had been administered successfully, all participants' initial and booster essays were subjected to a linguistic analysis using the computerized text analysis program LIWC (*Linguistic Inquiry and Word Count*; Pennebaker, Francis, & Booth, 2001). LIWC counts words in text files and sorts them into 72 language categories, including linguistic dimensions (words per sentence, articles, etc.), psychological processes (e.g., emotional and cognitive), relativity (e.g., time and space), and personal concerns (e.g., sports, religion, death). The program produces the analyzed text as the percentage of total words found along these language categories.

The lists of words that define each category were created over a period of several years and multiple steps. Inter-rater reliability for agreement on word category placement ranged from 93 to 100% over the stages in this process (Pennebaker, Mayne, & Francis, 1997). Pennebaker & King (1999) demonstrated that LIWC detects language use as a reliable individual difference, has a robust four-factor structure, and good divergent and convergent validity with measures of motivation, behavior, and the five-factor personality dimensions.

Of special interest in this study were the psychological processes categories as they were reflected in participants' essays. LIWC classifies psychological processes along emotional and cognitive dimensions. The emotional categories of LIWC consist of positive emotion words (including the sub-categories of words related to positive feelings and optimism) and negative emotion words (including the sub-categories of words related to anxiety, anger, and sadness). The cognitive categories of LIWC include words that signify causal thinking (e.g., because, explain, think) and insight (e.g., understand, insight, hope).

Measures of Mood

The Beck Depression Inventory (BDI; Beck et al., 1979; Appendix B). This 21-item inventory was used to measure participants' level of depression. It is a widely used self-report measure with high internal consistency (average coefficient alpha = .81), high concurrent validity (clinical ratings: $r=.60$; MMPI-D: $r=.60$), high temporal stability ($r=.83$), and high construct validity in that it measures many symptoms considered to be

indicative of depression (Beck, Steer, & Garbin, 1988). Scores range from 0 to 63, with higher scores indicating more severe depression.

Inventory to Diagnose Depression-Lifetime Version (IDD-L; Zimmerman & Coryell, 1987; Appendix C). This 22-item inventory was used to diagnose a lifetime history of depression among participants. This inventory was used during pre-testing to screen potential participants. A modified version of the IDD-L was administered at the 6-month follow-up (Time 3) to determine whether participants experienced any significant depressive episodes throughout the course of the study. The IDD-L is designed to assess both the extent and duration of prior depressive symptoms. The total scores range from 0 to 88, with higher scores indicating more severe depression. Participants are asked to recall a week in their lives when they felt most depressed and subsequently select a statement on each of the 22 items describing how they felt during that time. In addition, participants indicate whether they felt that way for less or more than two weeks. Standard scoring procedures were followed: only items which were indicated to last longer than two weeks were counted towards the total score.

This self-report instrument has good internal consistency (Cronbach's $\alpha = .92$) and split-half reliability (Spearman-Brown coefficient = .90). Using clinical ratings as a criterion measure, the IDD-L has been demonstrated to have good sensitivity (74%) and specificity (93%), with an acceptable level of agreement between the inventory and the clinical rating ($\kappa = .60$) (Zimmerman & Coryell, 1987).

Measures of Emotion-Regulation

Ruminative Response Scale (RSS; Nolen-Hoeksema & Morrow, 1991; Appendix E). This 22-item inventory assesses responses to depressed mood that are focused on the self, on symptoms, and possible causes and consequences of mood. Its internal consistency (Cronbach's alpha) is .89. It has been shown to have significant convergent validity ($r=.62$) with ruminative responses to depressed mood (Nolen-Hoeksema & Morrow, 1991).

Emotion Regulation Questionnaire (ERQ; Gross & John, 2003; Appendix F). This 10-item scale assesses individuals' emotion regulation practices on two distinct dimensions: suppression and reappraisal. Participants indicate their agreement with these emotion-regulation practices on a scale of 1 (strongly disagree) to 7 (strongly agree). Coefficient alpha reliabilities averaged .79 for the reappraisal scale and .73 for the suppression scale. Test-retest reliability emerged as .69 for both scales (Gross & John, 2003). Significant discriminant and convergent validity was demonstrated between the ERQ scales and a variety of measures, including rumination, personality, and coping measures (Gross & John, 2003).

Emotional Approach to Coping Scale (Stanton, Kirk, Cameron, & Danoff-Burg, 2000; Appendix G). This 16-item inventory is designed to assess coping with stressful situations through the emotional approach. Items tap two distinct dimensions, emotional expression and emotional processing, which involve active attempts to acknowledge and understand one's emotions. Exploratory and confirmatory factor analyses, along with longitudinal and experimental studies, indicate that emotional expression and emotional

processing are distinct forms of the emotional approach to coping. Studies showed convergent validity with approach-oriented coping strategies and divergent validity with avoidance-oriented coping strategies (Stanton et al., 2000). Internal consistency (Cronbach's alpha) was .91 for both the Emotional Processing subscale and the Emotional Expression subscale. Test-retest reliabilities for were .78 for the Emotional Processing scale and .74 for the Emotional Expression scale.

Measures of Physical Health, Academic Performance, and Stressful Life Events

Participants provided their informed consent to release their visit information from University Health Services and their grade point average, number of hours taken, and college entrance exam scores from the Registrar's Office for research purposes (Appendix A). Participants furthermore filled out a separate measure on physician visits at the initial assessment (inquiring about physician visits over the past 3 months) and at the 5-week and 6-month follow-ups (Appendix H). This measure assesses any health-related visits, which could have occurred both inside and outside of University Health Services.

Pennebaker Inventory of Limbic Languidness (PILL; Pennebaker, 1982; Appendix I). A modified 12-item version of the original 54-item measure was used to assess the frequency of occurrence of commonly occurring physical symptoms and sensations at Times 1, 2, and 3 of the study. PILL items are rated on a 5-point scale ranging from "Have never or almost never experienced the symptom" (A) to "More than once every week" (E). Sample items include insomnia, upset stomach, headaches, nausea, and sore throat. The PILL has demonstrated high internal consistency (Cronbach's alpha

= .88) as well as test-retest reliabilities averaging between .79 and .83 (Pennebaker, 1982).

Negative Life Events Questionnaire (NLEQ; Saxe & Abramson, 1987; Appendix J). At the 6-month follow-up, participants completed the NLEQ in order to assess the presence and degree of negative life events between Time 1 and Time 3 of the study (approximately six months). The NLEQ consists of 66 items depicting interpersonal and academic stressors. The NLEQ was found to have a test-retest reliability of .82 and concurrent validity through a positive correlation with BDI scores ($r = .55, p < .01$) (Saxe & Abramson, 1987).

Follow-up Questionnaire on Participants' Subjective Experience (Pennebaker, Colder, & Sharp, 1990; Appendix K). Participants were presented with a series of Likert-scale (7-point) and open-ended questions about their subjective experience in the study (Appendix K). Some examples included questions about how much participants thought and talked about what they wrote, how happy and sad they have felt since the beginning of the study, how meaningful the study was to them, and whether they would participate in the study again. These questions are typically used at the end of writing studies (e.g., Pennebaker, Colder, & Sharp, 1990; Pennebaker & Francis, 1996) to obtain a sense of what subjective benefits participants took from the study.

Procedure

Pre-testing and Initial Assessment (Time 1)

Prior to the onset of the study, approval from the Institutional Review Board at the University of Texas at Austin was obtained. Participants were pre-tested during the

official pre-testing period during the first four weeks of the Fall 2003 semester. To qualify for the study, participants had to meet criteria of (a) having had at least one past mild depressive episode and (b) not being currently depressed. Qualified participants were determined using normative data on the Beck Depression Inventory (BDI; Beck et al., 1979) and the Inventory to Diagnose Depression – Lifetime Version (IDD-L; Zimmerman & Coryell, 1987), which were administered on the Department of Psychology’s online website as part of pre-testing. Individuals scoring a 12 or lower on the BDI and a 25 or higher on the IDD-L were recruited for the study. These criteria conform to previously employed classification criteria in large samples (e.g., Rude, Gortner, & Pennebaker, in press). A minimum recovery time of two months was required to insure that residual depression symptoms did not confound the results. Two-hundred and three participants met these criteria and were recruited for the study via a personalized e-mail invitation from the principal investigator. Out of these 203 individuals, 108 (53.2 %) agreed to participate.

Time 1 of the experiment took place from late September to mid-October during the Fall 2003 semester. Upon arrival at the lab, participants first completed consent and demographic information forms (Appendices A and D). Due to logistical and scheduling reasons, several weeks elapsed between pre-testing and the onset of the study for a large number of participants. Therefore, the BDI was again administered to screen out participants who may have developed significant depressed mood since the pre-testing period. This is especially crucial since most participants were incoming first year students for whom the first few weeks of the semester may be a tumultuous and stressful

time of adjustment, which in turn could possibly trigger a depressive episode in vulnerable individuals. The BDI was scored immediately and participants who indicated significant distress (i.e., a BDI score of 13 and above) were debriefed and given information about depression and counseling resources. Eleven participants had to be released from the study due to an elevated BDI score at Time 1. Therefore, out of the 108 participants who initially came into the lab, 97 remained in the study.

The remaining participants then completed information about physician visits over the past 3 months, the Ruminative Response Style Questionnaire (RRSQ; Nolen-Hoeksema & Morrow, 1991), the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), the Emotional Approach to Coping Scale (EAC; Stanton et al., 2000) and the Pennebaker Inventory of Limbic Languidness (PILL; Pennebaker, 1987).

Intervention

Participants were randomly assigned to experimental and control conditions. Immediately upon completion of self-report measures, participants were verbally instructed by the experimenter to start their first writing session. They engaged in three consecutive writing sessions for 20 minutes each on three consecutive days (c.f., Pennebaker, 1989; 1997). Instructions for the experimental condition were as follows: *“For the next three days, I would like for you to write about your very deepest thoughts and feelings about any difficult or emotionally disturbing events you are experiencing in your life right now. You may also tie your topic in with any past stressful or traumatic experiences you’ve had. In your writing, I’d like you to really let go and explore your very deepest emotions and thoughts. You might link your topic to your relationships with*

others, including parents, lovers, friends, or relatives. You may also want to link your experience to your past, your present, or your future, or to who you have been, who you would like to be, or who you are now. You may write about the same general issues or experiences in all days of writing, or on different experiences each day. Don't worry about grammar or spelling- that is not important. All of your writing will be completely confidential."

Instructions varied over the three writing sessions for the control condition. The instructions for the first writing session were as follows:

"For the next 20 minutes, I would like for you to write about how you have used your time over the past 2 weeks. In your writing, please go into as much detail as possible in how you have spent your days and managed your time. In your account of your activities, please be as objective as possible. You should describe your activities in detail without discussing any of your own thoughts or feelings related to the topic."

For the next two consecutive days, participants in the control condition were asked to write about how they have used their time within the past 24 hours (Day 2) and how they plan to use their time during the next 2 weeks (Day 3).

Each participant completed their first day of writing in the lab while being timed by the experimenter using a stop watch. On Days 2 and 3, participants completed their writing exercise from their own or an on-campus computer on a secure web server. The webpage displayed both writing instructions and a timer throughout the writing exercise. A written and audible alert notified participants when their 20 minutes were up.

Five-Week Follow-Up (Time 2)

Five weeks after the initial writing intervention, participants returned to the lab for their first follow-up assessment. Time 2 took place from late October to late November 2003. Participants again filled out the BDI, measures of emotion-regulation and physical symptoms, and information about physician visits since the beginning of the study. At this time, 50% of the experimental writing condition and 50% of the control writing condition were randomly assigned to receive a booster session.

Instructions were as follows for the experimental booster session:

“Today, I would like for you to write again about your very deepest thoughts and feelings about any difficult or emotionally disturbing events you are experiencing in your life right now. You may also tie your topic in with any past stressful or traumatic experiences you’ve had. Again, I’d like you to really let go and explore your very deepest emotions and thoughts. Just to remind you, you might tie your topic to your relationships with others, including parents, lovers, friends, or relatives. You may also want to link your experience to your past, your present, or your future, or to who you have been, who you would like to be, or who you are now. If you have written about this event before, you may also include how your perspective of the event or events has changed since the last time you wrote about it. Don’t worry about grammar or spelling – that is not important. As usual, all of your writing will be completely confidential.”

Participants in the control group booster session were instructed to write about how they had used their time within the past 2 weeks.

Six-Month Follow-Up (Time 3)

Participants were contacted by e-mail to schedule their 6-month follow-up. Time 3 took place from mid-March to mid-April in the Spring 2004 semester. At this time, participants again filled out measures of emotion-regulation and physical symptoms (RRS, ERQ, EAC, and PILL), and reported physician visits since the last follow-up. In addition, participants completed the Negative Life Events Questionnaire (NLEQ; Saxe & Abramson, 1987; Appendix I) to assess the presence and degree of negative life events that may have occurred since the beginning of the study. Furthermore, participants filled out the BDI and an adjusted version of the IDD-L, which assessed any dysphoric episodes since the beginning of the study. Finally, participants completed the Likert - Scale and open-ended questions about their experience in the study (Appendix J).

Upon completion of the measures, participants were compensated with \$10 and debriefed. At this point, the experimenter engaged participants in a conversation about their experience in the study and solicited feedback.

Chapter 4: Results

In applying the expressive writing paradigm to a depression-vulnerable population, the purpose of this study was twofold: (1) to determine the long-term therapeutic and preventive effects of expressive writing in formerly depressed college students over the course of 6 months and (2) to assess the therapeutic effectiveness of booster writing sessions that were implemented 5 weeks after the initial writing intervention.

This study used a 2 (experimental or control writing) x 2 (booster or no booster) x 3 (time) design. The between-subjects factors were treatment condition and booster condition, while the within-subjects factor was time (baseline, 5-week follow-up, 6-month follow-up).

Hypotheses predicted that participants in the expressive writing group would display lower depression scores, more adaptive emotion-regulation strategies, fewer self-reported physical symptoms, fewer illness-related visits to a physician, and higher GPAs than participants in the control group at the 5-week and 6-month follow-ups. In addition, participants who received a booster writing session at Time 2 were expected to fare better on these measures than participants who did not write again.

Sample Characteristics

A total of 97 undergraduate students enrolled in an introductory psychology course at the University of Texas at Austin in the Fall 2003 semester participated in this study. Participants who met pre-screening criteria of scoring a 12 or lower on the Beck

Depression Inventory ($M=5.71$, $SD= 3.27$) and a 25 or higher on the Inventory to Diagnose Depression – Lifetime ($M=36.00$, $SD=10.58$) during pre-testing were recruited. Furthermore, participants had to score a 12 or lower on the BDI at Time 1 to remain in the study.

All 97 participants completed their three writing sessions (Time 1) and the 5-week follow-up (Time 2). No participant attrition occurred between Time 1 and Time 2. At the 6-month follow-up (Time 3), 92 participants (94.8 %) returned. Five participants did not return, even after repeated contacts by e-mail and phone from the investigator. Four of these five participants were in the experimental condition, and one was in the control condition. It is possible that the busy time towards the end of the semester inhibited these participants from returning, or that they had lost interest in participating. Of the 97 original participants at Times 1 and 2, 70 were female and 27 were male. Of the 92 participants who returned at Time 3, 67 were female and 25 male.

The mean age of participants was 18.96, with a standard deviation of 2.08 and a range from ages 18 to 36. At Time 1, the sample included 75 participants (77.3 %) of Anglo origin, 9 participants (9.3 %) of Asian/Asian-American/Pacific Islander origin, 11 participants (11.3 %) of Hispanic origin, no participants of African/African-American origin, and 2 participants (2.1 %) who indicated “Other” as their ethnicity. Nine participants (9.3 %) indicated that English was their second language.

Two participants were excluded from the statistical analysis, one from the experimental and one from the control condition. The excluded experimental group participant was a 64-year-old non-traditional college student who was more than 21

standard deviations above the mean age. Hence, this participant was likely to represent a different college experience and different adjustment-related struggles than the rest of the sample. The excluded control group participant had graduated after the Fall 2003 semester and entered the work force. Hence, important portions of this participant's data (i.e., University Health Services visits and GPA) were not available for the Spring 2004 semester. This participant's experience and struggles were possibly also different from the rest of the sample. As 5 participants were lost to attrition and 2 participants were excluded from the analysis, the final sample size used for statistical analyses included 90 participants.

Manipulation Check

As a manipulation check, participants' essays were subjected to a computerized text analysis using the program LIWC. Means, standard deviations, t- and p-values for relevant linguistic variables are displayed in Table 1. Independent samples t-tests were conducted to evaluate differences between the expressive and control writing groups along psychological processes words (i.e., word categories that capture emotional and cognitive processes). If the intervention was administered successfully, it would be expected that participants in the expressive writing condition would display significantly more emotional and cognitive words than participants in the control writing condition. Statistical analyses suggest that this was, in fact, the case. Participants in the expressive writing condition used significantly more negative and positive emotion words than participants in the control condition, including more words relating to anxiety, anger, sadness, positive feelings, and optimism. Participants in the expressive writing condition

also used significantly more cognitive words than participants in the control condition, including more words relating to causal thinking and insight. Finally, participants in the expressive writing condition wrote significantly more words per essay than participants in the control condition. These results indicate that participants in the expressive writing condition incorporated more thoughts and feelings into their essays than participants in the control condition.

Table 1. Means and Standard Deviations for Linguistic Categories

Linguistic Category	Experimental Condition (N=52)		Control Condition (N=38)		t-value	p-value
	Mean	SD	Mean	SD		
Word Count	713.99	282.26	541.85	206.15	6.08	<.001
Total Affect	4.80	1.20	1.68	1.12	24.11	<.001
Total Negative Emotions	2.33	.99	.43	.53	20.38	<.001
Anxiety	.64	.53	.11	.19	11.19	<.001
Anger	.55	.46	.12	.25	10.14	<.001
Sadness	.56	.48	.08	.16	11.10	<.001
Total Positive Emotions	2.43	.90	1.23	.79	12.52	<.001
Positive Feelings	.66	.55	.14	.20	10.59	<.001
Optimism	.55	.36	.34	.30	5.75	<.001
Total Cognitive Mechanisms	8.24	1.59	4.02	1.89	22.10	<.001
Causal Thinking	1.26	.57	.69	.69	9.08	<.001
Insight	2.49	.84	.83	.62	19.75	<.001

Note: Degrees of freedom (df) were 332 for each t-test. Linguistic categories are displayed in percent of total words.

Participants' essays in the experimental condition reflected a wide variety of stress and trauma. Topics included relationship problems (52.1 %), academic problems

(30.7 %), adjustment to college and loneliness (20.7 %), family problems (20.7 %), concerns about one's mental or physical health (13.6 %), body image concerns and eating disorders (11.4 %), bereavement (7.1 %), pregnancy and abortion concerns (2.9%), concerns around illegal activities (e.g., drugs) (2.9 %), rape victimization (1.4 %), abuse victimization (0.7 %), and other miscellaneous topics (e.g., housing problems, financial problems) (21.4 %).

Test of Differences between Groups on Baseline Measures

A series of 2 (Writing Condition) x 2 (Booster Condition) univariate analyses of variance (ANOVAs) were conducted to evaluate possible group differences on baseline measures. Although participants were randomly assigned to treatment or control condition, the analysis of baseline group differences on BDI scores at Time1 yielded a marginally significant main effect for Writing Condition, $p < .06$. Inspection of means revealed that participants who had been assigned to the expressive writing condition tended to score higher on the BDI at Time 1. Furthermore, the analysis of baseline group differences on self-reported illness-related visits to a physician yielded a marginally significant main effect for Booster Condition, $p = .07$. Participants who would receive no booster session at Time 2 tended to have made more visits to a physician in the 3 months preceding the study. These means and standard deviations are displayed in Table 2.

Table 2. *Test of Differences between Groups on Baseline Measures*

Measure	Experimental Group (N=52)				Control Group (N=38)			
	Booster (N=25)		No Booster (N=27)		Booster (N=19)		No Booster (N=19)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
BDI Time 1	6.68	2.50	5.52	3.50	4.32	2.90	5.53	2.40
Self-Reported Physician Visits Time 1	.32	.60	.52	.80	.11	.30	.47	.90

The expressive writing and control writing groups, as well as the booster session and no booster session groups did not differ significantly on any of the other baseline measures, including the pre-test scores on the Beck Depression Inventory (BDI) and the Inventory to Diagnose Depression – Lifetime (IDD-L) (all other p 's > .2).

Research Participants' Subjective Experience at Time 3

At Time 3 (6-month follow-up), participants were presented with several Likert-scaled questions about their subjective experience being in the study (adapted from Pennebaker, Colder, & Sharp, 1990). These questions inquired how much participants had thought and talked about their writing experience, to what extent participants experienced positive and negative long-lasting effects of writing, how happy and sad participants have felt since the writing exercise, how personally valuable participants perceived the overall study to be, and how likely they were to participate in the study again. Participants who had received a booster session were also presented with a question about how valuable they perceived the booster session to be.

A series of 2 (Writing Condition) x 2 (Booster Condition) univariate analyses of variance (ANOVAs) was computed to evaluate differences between the expressive (with booster; without booster) and control (with booster; without booster) writing groups along how participants experienced the writing study. The means, standard deviations, F- and p-values for these questions are presented in Table 3. Regarding how much participants thought about what they wrote, results yielded a significant main effect for Writing Condition, and a marginally significant main effect for Booster Condition. The interaction was not significant, $p > .9$. Follow-up simple effects tests revealed that participants in the expressive writing group thought more about what they wrote than participants in the control writing group, $p < .02$. Regarding how much participants talked to other people about what they wrote, results yielded a significant main effect for Writing Condition. No significant main effect for Booster Condition, $p > .2$, or interaction effect, $p > .4$, was found. Follow-up simple effects tests revealed that participants in the expressive writing group talked more about what they wrote than participants in the control writing group, $p < .05$. Regarding willingness to participate in the same experiment again, a significant main effect for Writing Condition was found. No significant main effect for Booster Condition, $p > .4$, or interaction effect, $p > .5$, was found.

Table 3. Research Participants' Subjective Experience at Time 3

Question	Experimental				Control				F- values	p- values	Effects
	Booster		No Booster		Booster		No Booster		(significant effects only)		
Since the experiment...	Mean	SD	Mean	SD	Mean	SD	Mean	SD			
1. How much have you thought about what you wrote?	3.44	1.76	2.93	1.47	2.63	1.46	2.16	1.26	5.95 2.34	p < .02 p < .10	Writing Condition, Booster Condition #
2. How much have you talked to other people about what you wrote?	2.24	1.61	1.67	1.21	1.53	0.84	1.37	0.68	3.97	p < .05	Writing Condition
3. To what degree do you feel that the experiment had a <u>positive</u> long-lasting effect on you?	3.60	1.76	2.93	1.62	2.79	1.62	2.79	1.72			---
4. To what degree do you feel that the experiment had a <u>negative</u> long-lasting effect on you?	1.64	1.04	1.19	0.48	1.53	1.02	1.47	1.02			---
5. How happy have you felt?	5.28	0.84	5.00	1.00	5.00	1.25	5.16	0.83			---
6. How sad or depressed have you felt?	3.00	1.22	2.89	1.12	2.95	1.47	3.00	1.45			---
7. To what degree has this experiment been valuable or meaningful for you?	3.48	1.76	3.63	1.50	3.16	1.54	3.16	1.46			---
8. If you had the chance to do it over again, would you participate in this study?	3.24	0.52	3.26	0.66	2.74	0.87	3.00	1.00	5.55	p < .02	Writing Condition
9. To what degree did you find it valuable or meaningful to write again after 5 weeks? (booster conditions only)	4.21	1.59			3.55	1.67					---

Note: Questions (with the exception of Question 8) were rated on a Likert Scale ranging from 1 (not at all) to 7 (a great deal). Question 8 ranged from 1 (definitely no) to 5 (definitely yes). Reported effects are significant at the 0.05 level (2-tailed). # denotes effects significant at the 0.10 level (2-tailed).

Follow-up simple effects tests revealed that participants in the expressive writing group were more likely to participate in the study again than participants in the control writing group, $p < .02$.

No significant group differences were found on self-reported negative long-lasting effects of the experiment, positive long-lasting effects of the experiment, or how happy or sad participants had felt since writing. In addition, participants in the experimental and control groups did not differ on the self-reported personal value of the overall experiment or the self-reported personal value of the booster session (all p 's $> .2$).

Correlations among Study Variables Prior to Experimental Interventions

Table 4 shows Pearson correlations among study variables at Time 1. As expected, BDI scores at Time 1 were significantly positively correlated with rumination scores and the experience of physical symptoms. Rumination scores were significantly positively correlated with the experience of physical symptoms, as well. Time 1 BDI scores were furthermore significantly negatively correlated with emotional processing scores.

Interestingly, there was no significant correlation between Time 1 BDI scores and whether or not participants had sought psychological counseling in the 3 months preceding the study. However, having sought counseling correlated significantly positively with total emotional approach to coping scores. In addition, visits to University Health Services correlated significantly positively with self-reported physician visits and seeking counseling.

The two subscales of the Emotion Regulation Questionnaire (suppression and reappraisal) were significantly negatively correlated. Furthermore, suppression scores correlated significantly negatively with emotional expression, emotional processing, and total emotional approach to coping. Reappraisal, on the other hand, correlated significantly positively with emotional processing and total emotional approach to coping.

Finally, the two subscales of the Emotional Approach to Coping Questionnaire (EAC), emotional expression and emotional processing, were significantly positively correlated. As expected, each of the subscales correlated positively with the total scale for the EAC.

Table 4. Correlations among Study Variables Prior to Experimental Interventions (Time 1)

	BDI	RRS	PILL	REAPP	SUPP	EMOEXP	EMOPRO	EAC	Physician Visits	UHS Visits	Counseling
BDI	1.00	.56**	.38**	-.03	.06	-.09	-.24*	-.19	.13	.01	-.05
Rumination		1.00	.45**	-.06	.07	-.10	-.03	-.08	.20	.07	.15
Physical Symptoms			1.00	.06	.01	-.10	-.11	-.13	.06	-.06	-.13
Reappraisal				1.00	-.29**	.18	.24*	.25*	-.04	-.13	.03
Suppression					1.00	-.69**	-.24*	-.59**	-.02	.08	-.14
Emotional Expression						1.00	.37**	.86**	.08	-.04	.17
Emotional Processing							1.00	.79**	.04	.00	.19
Emotional Approach to Coping (total)								1.00	.07	.03	.21*
Self-Reported Physician Visits									1.00	.25*	-.06
University Health Services Visits										1.00	.38**
Counseling History											1.00

Note: ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Examination of Hypotheses

A series of 2 (Writing Condition) x 2 (Booster Condition) x 3 (Time) repeated measures analyses of variance (ANOVAs) were computed on dependent variables. In separate analyses not reported here, the following variables were entered as covariates: Counseling History, pre-testing scores on the Beck Depression Inventory, pre-testing scores on the Inventory to Diagnose Depression – Lifetime, Time 3 scores on the Inventory to Diagnose Depression (6-month modified version), Time 3 scores on Negative Life Events (6-month version), gender, English as a second language, and classification (i.e., first year, sophomore, junior, and senior). The use of these covariates did not influence results significantly.

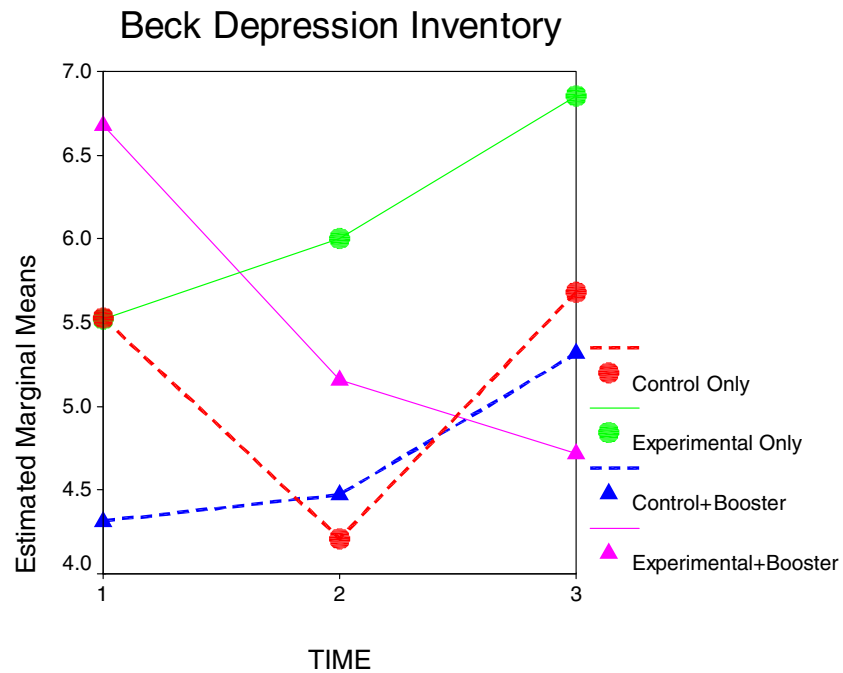
In the subsequent analyses, the main point of interest was Time 3 (6-month follow-up). Recall that this study only looked at individuals that were not depressed (pre-test and Time 1 $BDI \leq 12$); in other words, the range of Time 1 scores was restricted due to the nature of the population. Therefore, the chances of detecting significant differences between groups in dependent measures, particularly the BDI, would be quite small at Time 2 (5-week follow-up). Another reason for focusing mainly on Time 3 differences is the fact that the booster sessions were not introduced until Time 2. Hence, differences due to booster sessions could not be detected until Time 3.

Hypothesis 1: This hypothesis proposed that participants in the expressive writing condition will display lower depression scores at the 5-week and 6-month follow-ups than participants in the control writing condition. Participants in the experimental condition who received a booster session after five weeks will exhibit lower depression

scores at the 6-month follow-up than participants in the experimental condition who did not receive a booster session. This hypothesis was supported.

To test this hypothesis, a 2 (Writing Condition) x 2 (Booster Condition) x 3 (Time) repeated measures analysis of variance (ANOVA) was computed on Beck Depression Inventory (BDI) scores. Results yielded a significant three-way interaction for Writing Condition x Booster Condition x Time, $F(2, 85) = 4.17, p < .02$. Post hoc comparisons of adjusted Time 3 BDI scores controlling for baseline scores using the Mean Square Error term revealed that participants in the expressive writing condition who had received a booster session had significantly lower BDI scores at Time 3 than participants in the expressive writing condition who had not received a booster session, $t(89) = 2.06, p < .02$. In addition, the same method of post hoc comparisons yielded that participants in the expressive writing condition who had received a booster session had marginally significantly lower BDI scores at Time 3 than participants in the control condition who had received a booster session, $t(89) = 1.21, p < .11$. This interaction is presented in Figure 1.

Figure 1. Beck Depression Inventory Scores across Groups and Time



Hypothesis 2: Recall that this hypothesis predicted that participants in the expressive writing condition will display lower rumination and suppression scores and higher scores in reappraisal and emotional approaches to coping than participants in the control writing condition. Those participants who received an additional booster session after five weeks were expected to score lower on rumination and suppression scores and higher on reappraisal and emotional approaches to coping than participants in the experimental condition who did not receive a booster session. This hypothesis was not supported.

To test this hypothesis, a series of 2 (Writing Condition) x 2 (Booster Condition) x 3 (Time) repeated measures analyses of variance (ANOVAs) was computed on scores

on the Ruminative Response Scale, the Emotion Regulation Questionnaire (suppression and reappraisal subscales), as well as the Emotional Approach to Coping Scale (emotional expression and emotional processing subscales).

Although none of these analyses yielded significant main or interaction effects, some trends were noted. The separate 2 (Writing Condition) x 2 (Booster Condition) x 3 (Time) repeated measures analyses of variance (ANOVA) for Rumination scores and Reappraisal scores yielded a marginal main effect for Time for each of these two variables, $F(2, 85) = 2.43, p < .09$ and $F(2, 85) = 2.47, p < .09$, all other p 's $> .12$. For each of these variables, mean scores showed a tendency to fall into the more adaptive direction (i.e., higher reappraisal and lower rumination) at the 5-week follow-up, and to return to baseline at the 6-month follow-up. Although the meaning of these trends is not quite clear, these patterns may be attributable to repeated testing effects or variations across time of the semester. Patterns for Rumination scores and Reappraisal scores are presented in Figures 2 and 3.

Figure 2. Ruminative Response Scores across Groups and Time

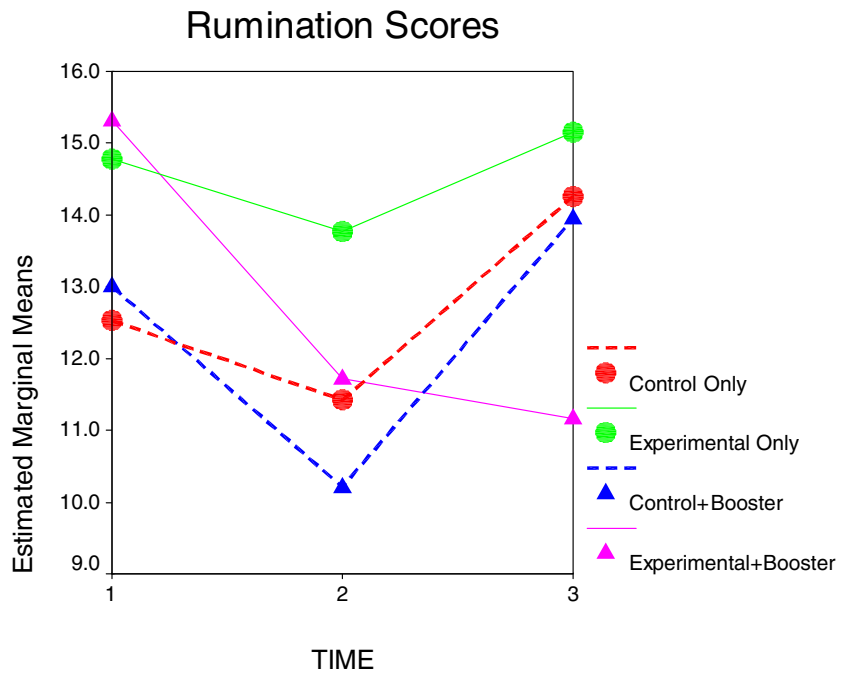
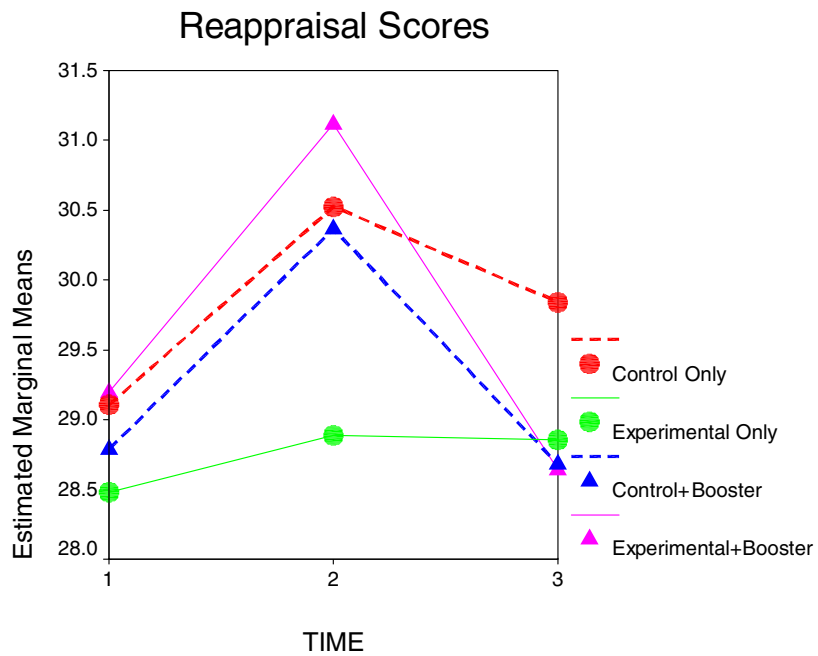


Figure 3. Reappraisal Scores (on ERQ) across Groups and Time



Hypothesis 3: This hypothesis predicted that participants in the expressive writing condition will exhibit fewer illness-related physician visits as well as fewer self-reported physical symptoms at the 5-week and 6-month follow-ups. Participants in the experimental condition who received a booster session after five weeks will exhibit fewer illness-related physician visits and self-reported physical symptoms at the 6-month follow-up than participants in the experimental condition who did not receive a booster session. This hypothesis was partially supported.

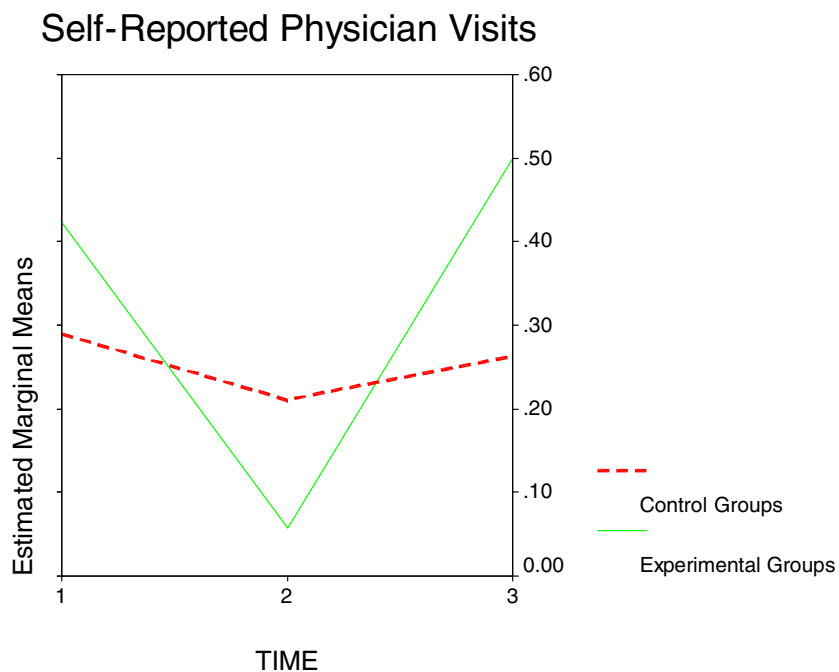
Recall that for the purpose of this study, illness-related physician visits were assessed in two ways. First, participants reported any physician visits (both on- and off-campus) in their questionnaire packet at Times 1, 2, and 3. Second, participants gave informed consent to release their visit information from University Health Services.

Overall, 46.7% of participants (51.9% of the experimental group, 39.5% of the control group) reported making illness-related visits to a physician during the study period. To test the study hypothesis, a 2 (Writing Condition) x 2 (Booster Condition) x 3 (Time) repeated measures analysis of variance (ANOVA) was computed on self-reported illness-related visits to a physician. Results yielded a significant main effect for Time, $F(2, 85) = 4.67, p < .01$, and a marginally significant interaction for Writing Condition x Time, $F(2, 85) = 2.61, p < .08$.

To decompose the interaction effect, post hoc comparisons of adjusted Time 2 physician visits controlling for baseline scores using the Mean Square Error term revealed that participants in the expressive writing condition had made marginally fewer physician visits 5 weeks after the initial intervention than participants in the control

condition, $t(89) = 1.44, p < .08$. At Time 3, on the other hand, this trend appeared to be reversed, indicating that participants in the expressive writing condition made more illness-related visits to a physician than control group participants. Post hoc comparisons of adjusted Time 3 physician visits controlling for baseline scores using the Mean Square Error term revealed that this group difference was a non-significant trend, $t(89) = 1.26, p > .11$. Figure 4 illustrates this pattern.

Figure 4. Self-Reported Illness-Related Visits to a Physician across Groups and Time

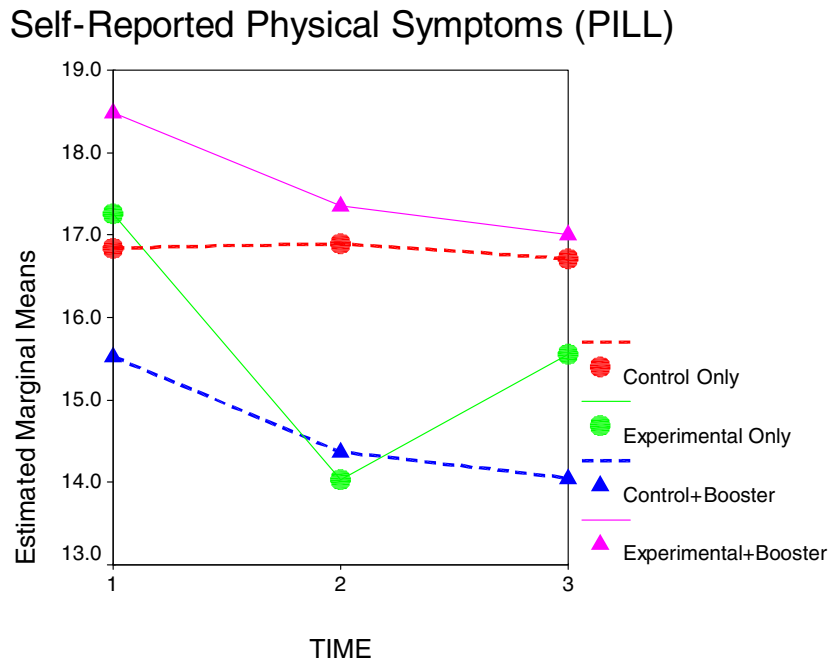


University Health Services data included each health center visit between August 27, 2003 and May 7, 2004 (first and last class day of the academic year, respectively) and respective illness diagnoses for each participant. This analysis revealed that only 30.0%

of all participants (34.6% of the experimental group, 23.7% of the control group) had used University Health Services during the time of the study. Since the Time 1 measurement point stretched over the course of 4 weeks, University Health Services data were converted into a visit/month ratio for each participant, controlling for the time point in the semester when the participant entered the study. Next, a 2 (Writing Condition) x 2 (Booster Condition) x 3 (Time) repeated measures analysis of variance (ANOVA) was computed on illness-related University Health Services visits. This analysis yielded no significant main or interaction effects (all p 's > .4).

Regarding self-reported physical symptoms on the Pennebaker Inventory of Limbic Languidness (PILL), a 2 (Writing Condition) x 2 (Booster Condition) x 3 (Time) repeated measures analysis of variance (ANOVA) yielded a significant main effect for Time, $F(2, 85) = 3.59, p < .03$, indicating that on average self-reported physical symptoms decreased from Time 1 to Time 2 across groups. No other main or interaction effects were significant (all p 's > .2). This pattern is displayed in Figure 5.

Figure 5. Self-Reported Physical Symptoms (PILL) across Groups and Time



Hypothesis 4: Recall that this hypothesis predicted that participants in the expressive writing condition will exhibit better academic performance, as indicated by a higher grade point average, at the 6-month follow-up (second semester post-writing) than participants in the control writing condition. Participants in the expressive writing condition who received an additional booster session at the 5-week follow-up are expected to exhibit a higher academic performance than participants in the experimental condition who did not receive a booster session. This hypothesis was not supported.

To test this hypothesis, a 2 (Writing Condition) x 2 (Booster Condition) x 2 (Semester) repeated measures analysis of variance (ANOVA) was computed on Grade Point Averages of participants, which had been adjusted for college entrance exam

scores, hours attempted in the Fall 2003 semester, and hours attempted in the Spring 2004 semester. No significant main or interaction effects were found (all p 's > .5).

Additional Exploratory Analyses

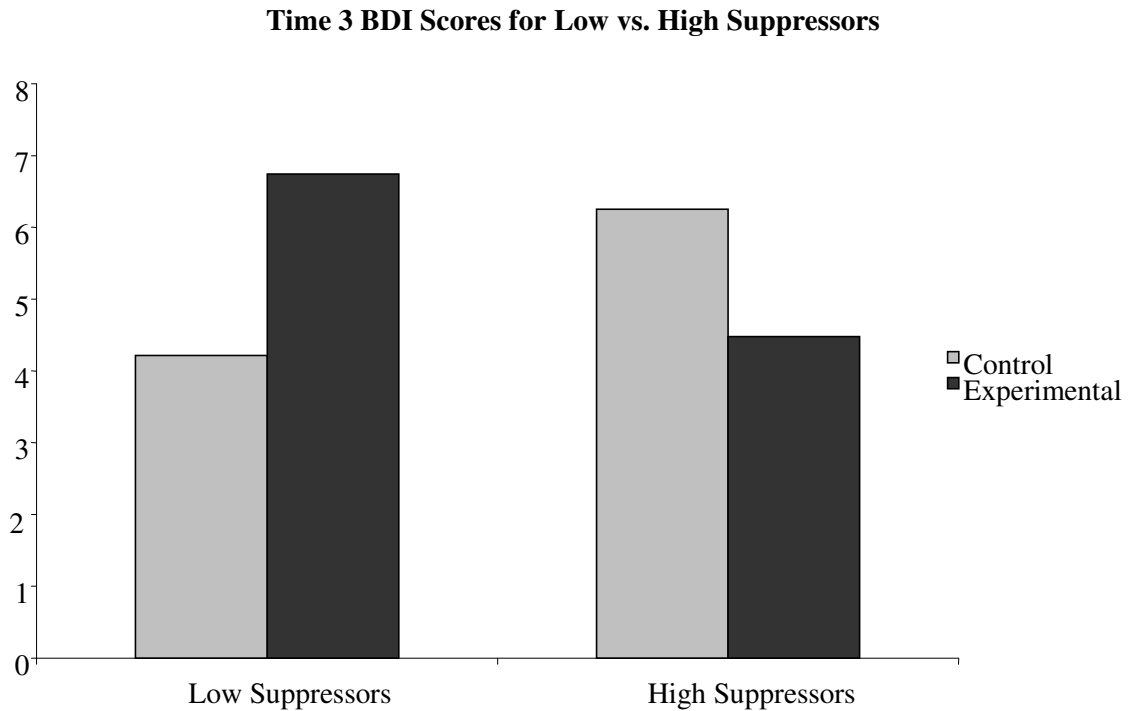
As described earlier, the suppression of negative emotions and thoughts can elicit both detrimental and ironic rebound effects. Depression-vulnerable individuals are likely to use such disadvantageous suppressive emotion-regulation strategies. As one rationale for this study, it was hoped that emotional disclosure would offset the detrimental consequences of suppressive emotion-regulation, particularly for individuals who habitually employ a great amount of mental control.

Benefits from Expressive Writing as a Function of Mental Control

An exploratory statistical analysis was performed to test whether individuals with high scores on mental control strategies would benefit more from expressive writing in this study than participants with low scores on mental control strategies. A median split on participants' scores on the Suppression subscale of the Emotion Regulation Questionnaire (ERQ) at Time 1 was used to determine level of mental control. Participants were identified as high suppressors if they fell into the top half of suppression scores and as low suppressors if they fell into the bottom half of suppression scores. Exploratory analyses therefore included Suppression Condition (high vs. low) as an additional between-subjects factor. Independent samples t-tests revealed that high and low suppressors did not differ in their baseline scores on any of the dependent measures (all p 's > .9).

Depression Scores for Low vs. High Suppressors. A 2 (Writing Condition) x 2 (Booster Condition) x 2 (Suppression Condition) x 3 (Time) repeated measures analysis of variance (ANOVA) on BDI scores revealed a marginally significant interaction for Writing Condition x Suppression Condition x Time, $F(2, 81) = 2.82, p < .07$. A post hoc examination of means controlling for baseline scores using the Mean Square Error Term revealed that at Time 3, high suppressors in the experimental writing condition displayed lower depression scores than high suppressors in the control condition, $t(89) = 1.86, p < .03$. On the other hand, low suppressors in the experimental writing condition displayed a trend toward higher depression scores at Time 3 than low suppressors in the control condition, $t(89) = 1.48, p < .07$. Figure 7 displays Time 3 means between groups.

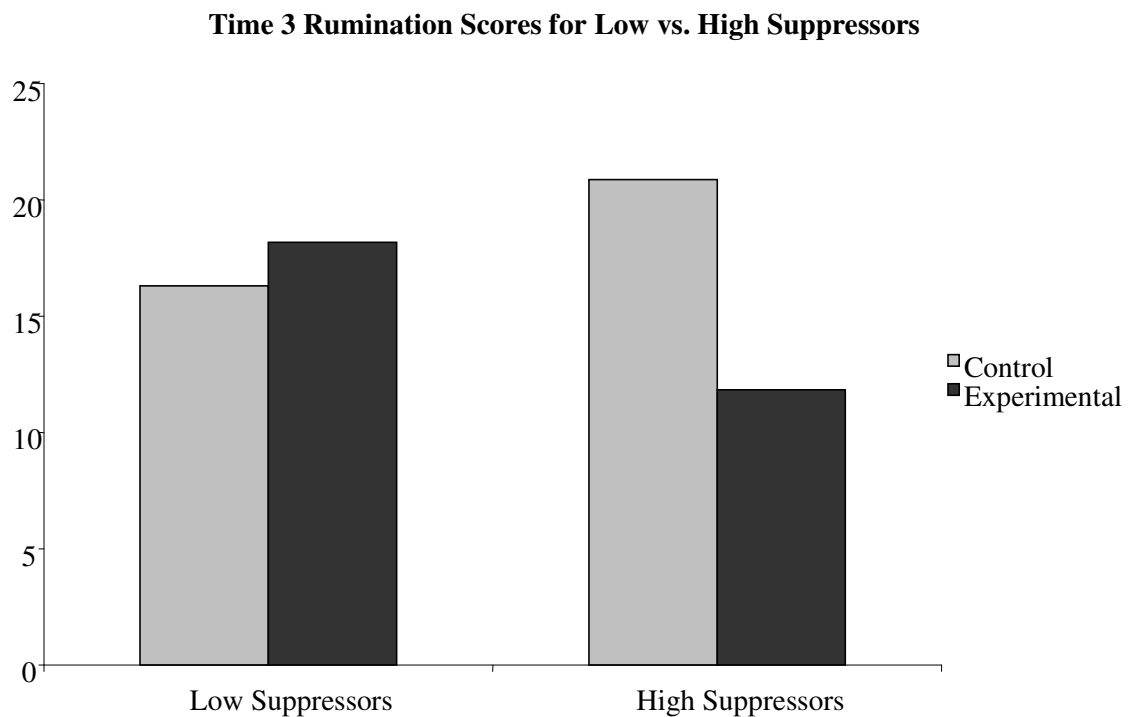
Figure 7. Mean Time 3 BDI Scores for Low vs. High Suppressors Controlling for Time 1 Scores



Rumination Scores for Low vs. High Suppressors. Similarly, a 2 (Writing Condition) x 2 (Booster Condition) x 2 (Suppression Condition) x 3 (Time) repeated measures analysis of variance (ANOVA) on Rumination Scores revealed a significant interaction for Writing Condition x Suppression Condition x Time, $F(2, 81) = 3.83, p < .03$. An examination of means controlling for baseline scores using the Mean Square Error Term revealed that at Time 3, high suppressors in the experimental writing condition displayed significantly lower rumination scores than high suppressors in the control condition, $t(89) = 2.68, p < .01$. On the other hand, group differences were not

significant among low suppressors, $p > .13$. Figure 8 displays Time 3 means between groups.

Figure 8. Mean Time 3 Rumination (RRS) Scores for Low vs. High Suppressors Controlling for Time 1 Scores



Other Analyses for Low vs. High Suppressors. Exploratory analyses using the suppressor median split with the other dependent study variables (Reappraisal, Suppression, Emotional Expression, Emotional Processing, self-reported physical symptoms, illness-related physician visits, and GPA) did not yield any significant effects (all p 's $> .2$).

Benefits from Expressive Writing as a Function of Other Factors

Additional exploratory analyses were performed using a median split on participants' pre-testing scores on the depression (BDI), history of depression (IDD-L), and Negative Life Events (NLE) as between-subjects factors. None of these analyses yielded significant main or interaction effects on any of the dependent variables (mood, emotion-regulation, emotional approach to coping, physical symptoms, and illness visits) (all p 's > .2).

Chapter 5: Discussion

Review of Study Findings

The results of this study suggest that writing about emotionally stressful topics with a booster session reduces depression symptoms over a 6-month period. Consequently, booster writing sessions may constitute a crucial therapeutic component in achieving long-term preventive mood effects through written disclosure. This finding is particularly striking since past studies (e.g., L'Abate & Baggett, 1997) have shown that positive effects of writing without a booster session on self-reported depressed mood had diminished after 6 months.

Another important finding of this study is that expressive writing disclosure is linked to a trend of improved physical health, as measured by self-reported illness-related physician visits, in the weeks following the intervention but not at the six-month follow-up. In fact, at the six-month follow-up, there was a non-significant trend indicating that participants in the expressive writing condition had made more illness-related physician visits than control group participants. This study failed to detect significant health differences between the groups along University Health Services visits. These findings starkly contrast with findings of previous writing studies (e.g., Pennebaker & Beall, 1986; Pennebaker, Mayne, & Franics, 1997; Pennebaker, Kiecolt-Glaser, & Glaser, 1988). However, what is striking about this study's sample is that participants had an unusually low base rate of University Health Services usage – 30%, as compared to an average of 77% in previous Pennebaker writing studies (c.f., Pennebaker, 1989). A possible explanation is that Pennebaker's studies were conducted at a small private university

(Southern Methodist University), where about 60 % of students are from outside the State of Texas (Southern Methodist University, 2003) and may therefore be more dependent on the local Student Health Center. Conversely, about 92 % of students at the University of Texas are Texas residents (University of Texas at Austin, 2004), which is a likely representation of this sample, as well. Possibly many students in this study still see their physician in their home town for health problems, which is underlined by the fact that 59% of this sample are first year students. Hence, the self-reported physician visits in this study may have conveyed a more accurate assessment of participants' health than University Health Services data.

Furthermore, this study found that individuals who employ high levels of mental control (i.e., suppression strategies) appear to benefit most from expressive writing. Results suggest that high suppressors benefit from writing by being less depressed and less ruminative after 6 months (low suppressors displayed the opposite pattern). These findings correspond to recent research by Lischetzke and Eid (2003), who found that individuals with high emotion regulation scores benefit from attention to feelings, whereas individuals with low emotion regulation scores do not. In other words, individuals who are high emotion-regulators can enhance the effectiveness of their mood control strategies and thus improve affective well-being by increasing awareness of their feelings. The current study specifies that individuals who are high suppressors can indeed improve their emotion regulation abilities (i.e., less rumination) and consequently their affective well-being (i.e., lower depression) by participating in expressive writing. Importantly, these patterns point to a potentially imperative moderator variable –

suppression - for the written disclosure paradigm. Particularly in this population, which is likely to employ high levels of potentially perilous mood control strategies, an intervention that targets these very tactics can be invaluable.

Another noteworthy finding of this study is that participants who wrote about emotional topics both thought and talked more about their writing topics than participants who wrote about time management. This provides evidence for the cognitive and social processing of the stressful emotional material. The finding that participants talked more about their emotional upheaval furthermore replicates multiple previous findings and underlines the social consequences of writing (for a commentary, see Pennebaker, 2004). In fact, Pennebaker and Graybeal (2001) have suggested that the benefits of written disclosure may hinge on changes in social and linguistic behaviors, such as increased social disclosure and altered social networks.

Finally and importantly, this study found that participants who wrote about emotional topics were more willing to participate in this study again. These indicators, along with the low attrition rate (5 participants over 6 months), suggest that written disclosure is not only a promising intervention for mental and physical well-being, but that participants who received the intervention also found the experience worthwhile.

Nonetheless, and surprisingly, this study failed to produce several of the hypothesized findings. Particularly, hypothesized effects were not found for emotion regulation measures (i.e., rumination, suppression, reappraisal, emotional expression, emotional processing), self-reported physical symptoms (PILL), and academic performance (GPAs). In addition, the booster writing session did not appear to have an

effect on any of the measures except depression scores. This study also failed to show that participants in the experimental condition experienced the overall study as more meaningful than participants in the control condition. In fact, on 1-7 Likert Scale, the expressive writing condition mean was 3.56 and the control condition mean was 3.16. This is in stark contrast to typical findings in writing studies. For example, in Pennebaker and Francis' (1996) study, the experimental and control groups scored a mean of 4.4. and 3.2, respectively. Also, unlike previous studies (e.g., Pennebaker, 1989), this study also failed to find any significant group differences along self-reported sadness and happiness on the follow-up questionnaire. It appears that the subjective experience of individuals in the expressive writing condition in the present study was less pleasant than is typically found, which carries interesting implications for this sample.

One possible explanation for these findings (or lack thereof) is that since formerly depressed individuals tend to work hard to keep negative thoughts and feelings at bay (e.g., Abramson et al., 2002; Wenzlaff, 1993), being instructed to focus on negative thoughts and feelings may have unintentionally produced a more uncomfortable situation for this vulnerable sample than for the general population. Whereas negative feelings during and after expressive writing are common (e.g., Smyth & Pennebaker, 2001), these feelings may be psychologically threatening to someone who goes through great efforts to habitually keep them under control, avoid them, or otherwise inhibit them. Anecdotally, one experimental group participant wrote as a comment on her follow-up questionnaire,

“In the writing portion, it alarmed me when I became emotional after writing about personal/family issues that I had never really taken the time to let them out in any way, other than placing them in the back of my mind”.

Another wrote on the follow-up questionnaire:

“I think writing during your depression is good, but that when you’ve begun to feel better you shouldn’t force yourself to keep writing about negative things.”

Although it is unclear whether these anecdotal impressions are representative of the entire sample, these quotations give some clues on why perhaps some hypothesized benefits were not detected. It is likely that a sense of “alarm” could have initiated a hesitancy to truly let go of thoughts and feelings, or could have otherwise influenced the material participants chose to write about in order to maintain a sense of emotional control and safety.

Similarly, focusing on a “benign” topic such as time management without having to delve into thoughts and feelings may be perceived as a non-threatening, perhaps even soothing or beneficial activity for people who employ high levels of emotion-regulation. This sample in particular may have benefited from the sense of control instilled by describing how they spend their time. Writing about time management could furthermore serve as a welcomed distractor from negative thoughts and feelings. Finally, the time management writing instructions across the three days encouraged participants to ponder different time perspectives (i.e., the past two weeks, past 24 hours, and the next

two weeks, respectively). This, in turn, may have created broader or more meaningful reflections than, for example, writing about the same 24 hours for all three days. The following written comments on follow-up questionnaires of control group participants support some of these arguments:

“Since my first semester was so overwhelming it was good for me to be able to sit and write about my life without adding how I felt.”

Another wrote,

“While I would say the influence has been minimal, I did realize that writing about how I spent my time helped me to look at things more objectively and re-evaluate priorities.”

The fact that most of the variables for which hypotheses were not supported were measured by self-report (with the exception of academic performance) could be another important clue to why this study failed to produce some of the hypothesized effects. Pennebaker (2004) points out that expressive writing has in general been successful in producing benefits in behavioral indicators, such as health, objective length of romantic relationships, and job acquisition. However, it is more difficult to detect positive effects of the intervention when dependent variables consist of self-report measures. This phenomenon is not limited to written disclosure studies in particular. Multiple investigators (i.e., Schwartz, 1999; Sloan & Marx, 2004b) have detailed the perils and challenges of depending exclusively on self-reports in psychological research. Pennebaker (2004) elaborates that while self-reports may accurately reflect an

individual's self-theory, they provide researchers with "...very little knowledge of what is truly happening to people once they leave [their] labs or offices" (p.141).

On a related note, the administration of self-reports that produce a strong focus on a person's emotional life introduces additional problems. First, the self-report measures may have caused participants to approach the writing exercise with thoughts, expectations, and even emotions that are atypical for most writing studies. In other words, these measures may have created certain demand characteristics not commonly found in studies of expressive writing. Second, it appears from anecdotal evidence from the debriefing sessions that a number of participants found the mere act of focusing on their innermost feelings and emotional worlds by filling out questionnaires helpful and informative. Hence, the sole administration of the self-report measures could possibly have produced benefits through a process of self-reflection and self-exploration.

Following are a few comments participants wrote on their follow-up questionnaires:

"Filling out the questionnaires has helped me to evaluate myself on a more categorical, specific level."

"By answering the questions I was made more aware of my own feelings and took time out to think about the different feelings that I had over the semester."

"I answered the questions honestly and was able to learn things about myself. I am able to walk away from this experience having learned something about my emotions and how I deal with various situations".

“There were some questions that made me re-evaluate what my true feelings were at the time...and I found it helpful to analyze my own feelings.”

It is puzzling why the booster writing session did not produce the hypothesized effects in any of the measures besides depression. One explanation is that participants may be reluctant to re-explore their emotional upheaval as deeply and thoroughly after having already explored and possibly resolved the material. It is likely that the re-visiting of thoughts and feelings through writing would merely constitute a “bird’s eye view” without adding any therapeutic value to what has already been accomplished. The fact that participants in the booster conditions did not perceive the study more meaningful than participants who did not receive a booster session (see Table 3) supports this premise.

Statistical power is another issue regarding the lack of findings on some of this study’s measures. A larger sample size (and hence larger cell sizes) may have increased statistical power to be able to detect group differences for both writing and booster conditions alike along dependent measures. Unfortunately, only slightly more than half of recruited qualified participants chose to partake in the study. Also, some of this study’s measures may not be sensitive enough to detect small but meaningful changes in symptoms and well-being.

Nevertheless, it is important to note that the booster session contributed to lower depression scores in the expressive writing group. Hence, the booster writing session

appears to be a promising intervention for preventing relapse into depressed mood after 6 months, whereas other self-report and behavioral measures remained unaffected.

Strengths of Current Study

One of the important features of this study is its longitudinal methodology which was designed to investigate and highlight the preventive effects of written disclosure over the course of 6 months. The study utilized a randomized, controlled design as well as psychometrically sound measures. In addition to self-report measures, behavioral variables (i.e., physician visits and GPA) were also of interest. This design thus represents a solid, yet clinically realistic approach to empirically evaluate the implementation of expressive writing, along with a booster writing session, in preventing depressive symptoms in a clinical sample.

Second, instead of recruiting “healthy” undergraduates, this study’s purpose was to evaluate the effectiveness of this intervention with vulnerable individuals who are potentially encountering perilous stressors at an important time in their lives. Because it examined a particular clinical population, this study employed a rigid selection procedure using empirically established (i.e., Rude, Gortner, & Pennebaker, in press) cut-off points from methodologically sound instruments.

Third, this study provided participants with the option to reflect on both current and past stressors and did not require participants to select a particular type of trauma. A recent review by Sloan and Marx (2004b) highlights that allowing participants to write about either current or past trauma, as well as providing participants freedom in selecting a topic, is likely to produce the most beneficial outcomes in written disclosure studies.

Finally, anecdotal evidence from debriefing sessions with participants brings to light that a number of participants in the experimental writing condition experienced meaningful changes due to the intervention. A considerable number of participants in the experimental condition (N=12) disclosed that since the beginning of the study, they had started to keep a regular journal (as opposed to N=2 in the control condition). Below are some testimonies that participants in the expressive writing group wrote on their follow-up questionnaire:

“Writing about the negative emotions I was experiencing definitely helped me get past my depression and I would never have done it had I not participated in this project. I also gained a valuable tool in dealing with my emotions.”

“As a novelist, the experiment helped me put more emotion in my work, which is key in what I do. As a person, it has helped me to better understand myself and those around me, and caused me to think about my emotions and theirs.”

“It made me go out and buy a journal, just so I could write in it and see what was going on. It’s easier to see when you start writing things down.”

“I know that it is healthy to share feelings with other people, but I rarely do that, so I guess that writing down my thoughts is a positive alternative to keeping everything bottled up inside. So this experiment gave me an outlet.”

“I am very bad at getting emotions out. (...)Being forced to sit down and write out my feelings literally changed me. About 2 weeks after the last session last semester, I forced myself to start a journal. I have written in it at least 3 times a week. Since, I understand my emotions better, and other people understand me better. I’ve found writing out these things helps a person find happiness.”

Other anecdotal evidence from debriefing sessions also revealed that writing helped one participant recognize current patterns in relationships, causing her to consequently change both her romantic and social interactions. This participant reported to the investigator, *“I feel that I am able to form more rewarding relationships and tell my friends what’s going on with me. I would be still depressed if I had not written in this study.”*

Limitations of Current Study

The conclusions of this study are restricted by some limitations. First, a potential selection bias may have influenced the results. Out of 203 qualified participants, 95 declined the invitation to participate in the study. Whereas most of these participants never replied to repeated invitation e-mails sent by the principal investigator, others stated they had already met their class research credit requirement or were simply not interested. The fact that participants were informed up front that this study required them to come into the lab three times over the course of 6 months may have been a factor in some individuals’ decision not to participate. Due to university policy and confidentiality

agreements, no other data was available for individuals who refused to participate; therefore, it was not possible to examine group differences between individuals who accepted or declined participation.

Second, and on a related note, the very nature of the population chosen for this study may have created some difficulties in detecting post-intervention differences between groups. Since the focus of this study was to examine the effectiveness of written disclosure in formerly depressed participants, those who showed even mild signs of depression (i.e., BDI scores above 12) were released from the study. It is therefore possible that this population, being by definition in remission, had little “room for improvement”, creating an inherent ceiling effect on a variety of measures. In other words, this population displays a restriction of range that poses a potential challenge to detecting the benefits of writing. If more lenient cut-off scores would have been employed for participant selection, the findings of this study could have plausibly been more hopeful. Nevertheless, strict cut-off scores for participant selection were necessary to recruit a homogeneous depression-vulnerable sample without confounding factors.

A third limitation of this study is that participants completed their writing assignments outside the lab (i.e., on a home or campus computer) during Days 2 and 3 of the initial intervention phase. This is a variation of Pennebaker’s (e.g., 1989) original protocol, which prefers participants to write in the lab for all sessions. Reasons for introducing this variation were mainly logistical due to the large number of participants and limited resources of research assistants. While all participants completed their first writing session on a lab computer in the current study, the uncontrolled environment of

the second and third writing sessions could have introduced unwanted noise into the intervention. For example, although participants were clearly instructed to write for 20 minutes, the investigator had no control over possible variations in participant activity during this time. Participants could have been interrupted by phone calls or other people, had the television running, or accomplished other simultaneous tasks during these sessions.

Finally, the study is limited by its lack of generalizability to individuals outside the college population. Although writing studies have been successful with multiple populations across a variety of education levels, nationalities, socio-economic statuses, and employment statuses (for a review, see Pennebaker, 1997; Smyth, 1998), it is presently unclear how findings with depression-vulnerable individuals would extend beyond this particular population. This is an important aspect to be addressed in future research.

Further Directions for Future Research

Without a doubt, the overall effectiveness of the writing paradigm has been demonstrated with multiple populations over approximately the last two decades. Although not all writing studies have produced hypothesized results, the least that can be concluded from the current state of research is that expressive writing has produced some form of benefit for a large majority of participants. While studies are continuously being added to the immense body of research on expressive writing, it is important to increase awareness of how the writing paradigm can be applied in therapeutic settings and with clinical populations. Researchers (e.g., Gidron, Peri, Connonlly, & Shalev, 1996; Graf,

2004; Schoutrop, Lange, Hanewald, Davidovich, & Salomon, 2002; Sloan & Marx, 2004a; Stroebe, Stroebe, Schut, Zeck, & van den Bout, 2002) have taken large strides to examine if, how, and when written disclosure works for special and/or clinical populations. The mixed results of this study add complexity to the issue at hand.

To make matters more complicated, the current state of research suggests that no single theory can account for the wide array of findings with written disclosure (for a review, see Sloan & Marx, 2004b). The findings of this study certainly underline that emotion-regulation (at least as measured by the self-reports used in this study) was not affected by expressive writing in the hypothesized manner. Thus, this study failed to support Lepore et al.'s (2002) Emotion-Regulation Model, which proposes, among other premises, that written disclosure leads to increased emotional expressiveness and less avoidance. On the other hand, it appears that Pennebaker's (1989, 1997) original Inhibition Theory was at least partially supported by this study. Individuals in the expressive writing condition showed signs of physiological disinhibition, as evidenced by fewer physician visits in the 5 weeks after the initial intervention. Furthermore, highly inhibited individuals (i.e., high suppressors) benefited more from expressive writing than less inhibited individuals. Ultimately, it remains to be explored which possible combination of current theories, or which yet undiscovered single theory, can explain the mechanisms of expressive writing.

Moreover, individuals with a history of depression or other psychological disorders may require more writing sessions or sessions of longer duration to experience long-lasting positive effects. This argument is consistent with practice of prolonged

exposure (c.f., Sloan & Marx, 2004 a&b) or alternatively, habituation (c.f., Lepore et al., 2002), which proposes that expressive writing promotes exposure to avoided or suppressed stimuli and provides opportunity to build a corrective cognitive structure about the stimuli, responses, and meanings. It makes sense that this premise would be particularly relevant to individuals who habitually suppress or avoid negative thoughts and feelings, such as the sample in this study. While Smyth's (1998) meta-analysis of writing studies found that the number and duration of writing sessions did not significantly influence the overall effect size of writing outcomes, it is important to remember that this meta-analysis only included studies with non-clinical samples. Clinical or clinically vulnerable samples may require more frequent and longer writing sessions to accomplish necessary disinhibition, cognitive restructuring, and habituation. In addition, these samples may require longer follow-up periods than 6 months to determine true long-term intervention benefits. Future research could empirically address these questions.

Next, there is an empirical necessity to further explore the value of booster writing sessions. While this study provided initial evidence for the effectiveness of booster sessions, future studies should focus on which particular populations can benefit from booster sessions. Furthermore, the most ideal time to introduce a booster session remains to be determined. The current study allowed only a relatively short time to elapse between the initial intervention and the booster session. It would be interesting to examine how results would differ if booster sessions were introduced after varying and longer intervals; for example at one, three, and six months after the initial intervention.

Cognitive-behavioral therapies often introduce booster sessions at an increasingly reduced frequency after the termination of the acute treatment phase (Clarke et al., 1998). The translation of this practice to expressive writing remains to be empirically evaluated.

Future studies could furthermore apply linguistic text analysis (i.e., LIWC; Pennebaker, Francis, & Booth, 2001) to evaluate which type of linguistic changes across writing sessions best predict positive mental and physical health outcomes. For example, past studies (Pennebaker, Mayne, & Francis, 1997; Campbell & Pennebaker, 2003) found that certain linguistic categories in expressive writing samples, such as causal words, insight-related words, and personal pronouns, predict positive health outcomes. These studies suggest that cognitive change and flexibility play an important role in mediating the positive outcomes of emotional writing procedures. Further analyses of the writing samples in this and future studies could reveal important cognitive processes reflected in the language of depression-vulnerable participants that could potentially predict who benefits from writing and who does not.

Conclusions and Clinical Applications of Study Findings

This study represents the first known extension of the expressive writing paradigm to a preventive context with depression-vulnerable individuals. Moreover, for the first time, this study examined the impact of a booster writing session on participants' mental and physical well-being. The results of this study carry clinical importance for the larger context of depression as a highly recurrent disease. First, these findings suggest that expressive writing may prevent depression relapse in a depression-vulnerable sample over the course of 6 months and improve short-term physical health over the

course of 5 weeks. Since expressive writing is economical, highly accessible, and expedient, it could be introduced as a convenient and available intervention to multiple settings with a need for depression prevention – such as schools, community (mental) health centers, university counseling centers, hospitals, or other community-oriented agencies.

Second, due to this study's findings, expressive writing could be applied as an adjunct to therapy or even as maintenance therapy for depression-vulnerable clients. Possible applications may include the use of writing as homework assignments during one-on-one therapy (c.f., Graf, 2004), as an exercise within structured special population groups, or as a therapeutic maintenance tool for clients who have completed inpatient or outpatient psychological treatment. It is essential to remember that this study's findings underline the importance of booster sessions in lowering depressive symptoms over time. Hence, it is recommended that the use of writing in clinical applications with depression-vulnerable populations include intermittent booster sessions as part of the intervention. It would also be helpful if writing samples could be monitored by a mental health professional to ensure the progress and safety of depression-vulnerable clients.

Finally, an important asset of expressive writing is that it represents a safe forum to express previously undisclosed, emotionally intense material. People have many reasons to keep traumatic, emotional, or stressful material bottled up or unexpressed. Lack of social outlets, fear of social consequences and rejection, lack of access to mental health resources, personality variables, social norms, or cultural and language barriers are just a few. However, the opportunity to release such material in written, confidential

form has produced beneficial outcomes for thousands of participants of various backgrounds and in various settings. This study produced evidence of further clinical applicability of this intervention with a special vulnerable population.

Appendix A

IRB# 2003-07-19

Informed Consent to Participate in Research

The University of Texas at Austin

You are being asked to participate in a research study. This form provides you with information about the study. The Principal Investigator (the person in charge of this research) or his/her representative will also describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you don't understand before deciding whether or not to take part. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled.

Title of Research Study: Mental and Physical Well-Being of College Students

Principal Investigator(s) (include faculty sponsor), UT affiliation, and Telephone Number(s):

Eva-Maria Gortner, M.A., Doctoral Student in the Dept. of Educational Psychology, (512) 916-9165

James W. Pennebaker, Ph.D., Professor of Psychology, (512) 232-2781

Stephanie S. Rude, Ph.D., Associate Professor of Educational Psychology, (512) 471-1160

Funding source: Texas Psychological Foundation Graduate Research Award

What is the purpose of this study?

You are being invited to participate in an experiment that examines how writing affects your physical and mental well-being. This is Eva-Maria Gortner's doctoral dissertation project under the direction of Professor James W. Pennebaker, a faculty member in the Psychology Department of the University of Texas at Austin and Professor Stephanie Rude, a faculty member in the Department of Educational Psychology of the University of Texas at Austin. This particular study will involve 160 participants.

What will be done if you take part in this research study?

As has been explained by the experimenter, you will first complete some questionnaires that ask you about your background, mood, thought content, health, and visits to a physician and/or therapist. If you cannot or do not want to answer some or all of the questions, you do not have to. These items will help in knowing who you are and how you are feeling before the actual study begins. After you have filled out the questionnaires, you will be asked to write for 20 minutes in a stream of consciousness about certain aspects of your life. The writing session will take place in a private booth or room, where you will be typing on a computer. What you choose to write about will be kept completely confidential.

For the next two days, you will be asked to write two more times by logging onto the world wide web. You can do so from the privacy of your room and your computer, or any other computer you wish to use for this purpose that has internet access. Information on how to log on will be provided at the end of today's session. Each writing session, one tomorrow, and another one the day after tomorrow, will again last 20 minutes.

In about one month, you will be asked to return and to fill out some more questionnaires about your mood, your thought content, your health, and your visits to a physician and/or therapist. You may or may not be asked to write for 20 minutes about certain aspects of your life at this time. The researcher will send you a reminder e-mail and/or give you a telephone call to remind you of your appointment.

In six months, you will be asked to return one more time to fill out questionnaires about your mood, your thought content, and your health. At this time, you will also receive a questionnaire that will ask you about any significant life events you have experienced since the beginning of the study. Furthermore, you may or may not be interviewed by the researcher at this time about how you have been feeling. Again, the researcher will send you a reminder e-mail and/or give you a telephone call to remind you of your appointment. Finally, the principal investigator, Eva-Maria Gortner, will talk to you in detail about the experiment to get a sense of your views about it. Your feedback will be very important and pertinent so please be honest.

Whereas you will receive experiment credit for your participation in this study over the next 3 days and in about one month, you will be paid \$10 for your participation in 6 months. Below is the timeline and details of compensation for your participation. **Please note that the amount of experiment credit hours indicated below are cumulative in that if you decide to quit the study on Day 3, you will be entitled to only 2 hours of experimental credit.**

Timeline of the Procedure and Specification of Compensation

Days of Participation

Compensation

Day 1: show up, fill out questionnaires, write for 20 min.
Day 2: write for 20 min. from the privacy of your own computer
Day 3: write for 20 min. from the privacy of your own computer

Cumulative

	n/a
	1.5 hrs experiment credit
	2 hrs experiment credit
<u>One-month follow-up:</u>	
Show up, fill out questionnaires, you may or may not write for 20 min.	3.5 hrs experiment credit
<u>Six-month follow-up:</u>	
Show up, fill out questionnaires, you may or may not be interviewed	\$10

One part of this project involves linking people's responses in this study with their long-term health and academic performance. In order to do this, we ask for your permission to submit your name and UT-EID to the Student Health Service at the end of the school year. They will provide us with the number and dates of visits you have made to the health center of illnesses for the year prior to and up to two years after the study. The illnesses will only be specified by international illness codes (ICD). We will not see your actual health reports. In addition, we will ask the Registrar's Office to provide your grade point average, hours attempted, and college entrance exam scores for the semesters before and up to two years following this project. We will not see your actual courses or specific grades. Once we have received your health center and grade reports, all identifying information will be removed and replaced with a code number known only to the primary investigator (Eva-Maria Gortner). At the conclusion of the project, the master code list will be destroyed.

There is a possibility that we may also contact you again in one year and ask you to come in to fill out questionnaires about your mood, your thought content, and your health. You may or may not be interviewed at this time by an experimenter about how you have been feeling.

What are the possible discomforts and risks?

It is possible that you may find focusing on yourself for the questionnaire measures and writing about certain aspects of your life unpleasant. There may be additional risks that are unknown at this time. If you wish to discuss the information above or any other risks you may experience, you may ask questions now or call the principal investigator listed on the front page of this form. If you experience undue distress at any point during the study, you may withdraw at any time. Treatment will not be provided by any of the Principal Investigators or their associates; however, you may also contact UT's Telephone Counseling Hotline (471-CALL) or the UT Counseling and Mental Health Center (471-3515). It should be noted that you understand that there are certain circumstances under which the principal investigator may be required to breach confidentiality. All researchers are ethically and legally bound to disclose information in some situations defined by legislation if you express intent to harm self or other(s) or if you indicate that you are

involved in the abuse or neglect of a child, an elder, or a person who is unable to care for him/herself.

What are the possible benefits to you or to others?

One of the benefits of participating is to see how psychology experiments are conducted. At the conclusion of the study, the experimenter will tell you more about the actual study and its predictions. Many of the topics you may have learned about in Introductory Psychology about methodology will be experienced first hand.

Beyond receiving two 3.5 hours of credit toward your research participation requirement and additional 10 US Dollars for the 6-month follow-up, it is possible that you may gain benefits from the writing portion of this study, which in the past has helped people gain greater insight into themselves and their experiences and has aided participants in achieving both better mental and physical health in previous studies.

This study investigates some important questions about college students' physical and mental well-being. Your participation will further our knowledge about some basic theories concerning clinical psychology, the treatment of certain psychological disorders, and the improvement of health and well-being. This experiment is attempting to better understand how this effect occurs.

Finally, we hope to interest you in learning more about psychology in general. We are always interested in encouraging students to help us in conducting research. If you have any questions about the study or would like to get involved in more research, please talk to Eva-Maria Gortner.

If you choose to take part in this study, will it cost you anything?

Besides volunteering your time and participation in this study, this study will not cost you anything.

Will you receive compensation for your participation in this study?

Yes. As mentioned in the above chart, you will receive 3.5 hours of experimental credits for your Introduction to Psychology course if you complete the Days 1-3 and the one-month follow-up of this experiment. You will receive an additional \$10 for your participation in the six-month follow-up.

If you are not able to complete the study for any reason, you will be compensated for the hours you have spent in the study as specified in the chart above.

What if you are injured because of the study?

There is no anticipated physical risk as a direct result of participation in this study; however, if injuries occur as a result of study activity, eligible University students may be treated at the usual level of care with the usual cost for services at the Student Health Center, but no payment can be provided in the event of a medical problem.

If you do not want to take part in this study, what other options are available to you?

Participation in this study is entirely voluntary. You are free to refuse to be in the study, and your refusal will not influence current or future relationships with The University of Texas at Austin or any other organization.

How can you withdraw from this research study and who should I call if I have questions?

If you wish to stop your participation in this research study for any reason, you should contact Eva-Maria Gortner at (512) 916-9165. You are free to withdraw your consent and stop participation in this research study at any time without penalty or loss of benefits for which you may be entitled. Throughout the study, the researchers will notify you of new information that may become available and that might affect your decision to remain in the study.

In addition, if you have questions about your rights as a research participant, please contact Clarke A. Burnham, Ph.D., Chair, The University of Texas at Austin Institutional Review Board for the Protection of Human Subjects, 512/232-4383.

How will your privacy and the confidentiality of your research records be protected?

Authorized persons from The University of Texas at Austin and the Institutional Review Board have the legal right to review your research records and will protect the confidentiality of those records to the extent permitted by law. If the research project is sponsored then the sponsor also have the legal right to review your research records. Otherwise, your research records will not be released without your consent unless required by law or a court order.

If the results of this research are published or presented at scientific meetings, your identity will not be disclosed.

Will the researchers benefit from your participation in this study?

There will be no benefits beyond the principal investigator meeting the department's requirement for her doctoral candidacy.

Signatures:

As a representative of this study, I have explained the purpose, the procedures, the benefits, and the risks that are involved in this research study:

Signature and printed name of person obtaining consent **Date**

You have been informed about this study's purpose, procedures, possible benefits and risks, and you have received a copy of this Form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time. You voluntarily agree to participate in this study. By signing this form, you are not waiving any of your legal rights.

Printed Name of Subject **Date**

Signature of Subject **Date**

Signature of Principal Investigator **Date**

Consent to permit release of Health Center Visit Information

I consent to the release of my Student Health Center visit information to Principal Investigator Eva-Maria Gortner, for the research purposes detailed above.

_____/_____/_____
Print Name **Date of Birth** **Date**

UT-EID

Signature
Date

Signature of Principal Investigator **Date**

Consent to permit release of Educational Information

I have agreed to participate in a research study related to the physical and mental well-being of college students conducted by Ms. Eva-Maria Gortner under the supervision of Dr. James Pennebaker and Dr. Stephanie Rude.

Please release the following information from my educational records to either of them:

- 1) My grade point average**
- 2) the number of credits I took for each semester from August 2003 to May 2005.**
- 3) My college entrance exam scores (SAT or ACT).**

	/ /	
Print Name	Date of Birth	Date

Signature	Date

Signature of Principal Investigator	Date

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Appendix C

Inventory to Diagnose Depression – Lifetime Version

In this next section, try to remember **THE WEEK IN YOUR LIFE YOU FELT THE MOST DEPRESSED.**

What was the approximate starting and ending date of the episode you have in mind?
began: _____ ended: _____

Indicate the number of the one statement that best describes how you felt. Remember to also circle whether you felt that way for **MORE** or **LESS** than two weeks.

- 1) 0 I did not feel sad or depressed.
1 I occasionally felt sad or down.
2 I felt sad most of the time, but I was able snap out of it. .
3 I felt sad all the time, and I couldn't snap out of it.
4 I was so sad or unhappy that I couldn't stand it.

this lasted **MORE / LESS** than two weeks.

- 2) 0 My energy level was normal.
1 My energy level was occasionally a little lower than normal.
2 I got tired more easily or had less energy than is usual
3 I got tired from doing almost anything.
4 I felt tired or exhausted almost all of the time.

this lasted **MORE / LESS** than two weeks.

- 3) 0 I was not feeling more restless and fidgety than usual.
1 I felt a little more restless or fidgety than usual.
2 I was very fidgety, and I had some difficulty sitting still in a chair.
3 I was extremely fidgety, and I paced a little bit almost everyday.
4 I paced more than an hour per day, and I couldn't sit still.

this lasted **MORE / LESS** than two weeks.

- 4) 0 I did not talk or move more slowly than usual.
1 I talked a little slower than usual
2 I spoke slower than usual, and it took me longer to respond to questions, but I could still carry on a normal conversation.
3 Normal conversations were difficult because it was hard to start talking.
4 I felt extremely slowed down physically, like I was stuck in the mud.

this lasted **MORE / LESS** than two weeks.

- 5) **0** I did not lose interest in my usual activities.
1 I was a little less interested in 1 or 2 of my usual activities.
2 I was less interested in several of my usual activities.
3 I have lost most of my interest in almost all of my usual activities.
4 I have lost interest in all of my usual activities

this lasted **MORE / LESS** than two weeks.

- 6) **0** I got as much pleasure out of my usual activities as usual.
1 I got a little less pleasure from 1 or 2 of my usual activities.
2 I got less pleasure from several of my usual activities.
3 I got almost no pleasure from several of my usual activities.
4 I got no pleasure from any of the activities that I usually enjoy.

this lasted **MORE / LESS** than two weeks.

- 7) **0** My interest in sex was normal.
1 I was only slightly less interested in sex than usual.
2 There was a noticeable decrease in my interest in sex.
3 I was much less interested in sex.
4 I lost all interest in sex.

this lasted **MORE / LESS** than two weeks.

- 8) **0** I did not feel guilty.
1 I occasionally felt a little guilty.
2 I often felt guilty.
3 I felt quite guilty most of the time.
4 I felt extremely guilty most of the time.

this lasted **MORE / LESS** than two weeks.

- 9) **0** I did not feel like a failure.
1 My opinion of myself was occasionally a little low.
2 I felt I was inferior to most people.
3 I felt like a failure.
4 I felt I was a totally worthless person.

this lasted **MORE / LESS** than two weeks.

- 10) **0** I didn't have any thoughts of death or suicide.
1 I occasionally thought life was not worth living.
2 I frequently thought of dying in passive ways (such as going to sleep and not waking up) or

- that I'd be better off dead.
3 I had frequent thoughts of killing myself.
4 I tried to kill myself.

this lasted **MORE / LESS** than two weeks.

- 11) 0 I could concentrate as well as usual.
1 My ability to concentrate was slightly worse than usual.
2 My attention span was not as good as usual and I had difficulty collecting my thoughts; but this didn't cause any problems.
3 My ability to read or hold a conversation was not as good as usual.
4 I could not read, watch TV, or have a conversation without great difficulty.

this lasted **MORE / LESS** than two weeks.

- 12) 0 I made decisions as well as usual.
1 Decision making was slightly more difficult than usual
2 It was harder and took longer to make decisions, but I did make them.
3 I was unable to make some decisions.
4 I couldn't make any decisions at all.

this lasted **MORE / LESS** than two weeks.

- 13) 0 My appetite was not less than normal.
1 My appetite was slightly worse than usual.
2 My appetite was clearly not as good as usual, but I still ate.
3 My appetite was much worse.
4 I had no appetite at all, and I had to force myself to eat even a little.

this lasted **MORE / LESS** than two weeks.

- 14) 0 I didn't lose any weight.
1 I lost less than 5 pounds
2 I lost between 5-10 pounds.
3 I lost between 11-25 pounds.
4 I lost more than 25 pounds.
(If you circled #1,2,3, or 4: Were you dieting and deliberately trying to lose weight? YES NO)

this lasted **MORE / LESS** than two weeks.

- 15) 0 My appetite was not greater than normal.
1 My appetite was slightly greater than usual.
2 My appetite was clearly greater than usual.
3 My appetite was much greater than usual.

4 I felt hungry all the time.

this lasted **MORE / LESS** than two weeks.

16) 0 I didn't gain any weight.

1 I gained less than 5 pounds.

2 I gained between 5-10 pounds.

3 I gained between 11-25 pounds.

4 I gained more than 25 pounds.

this lasted **MORE / LESS** than two weeks.

17) 0 I was not sleeping less than normal.

1 I occasionally had slight difficulty sleeping.

2 I clearly didn't sleep as well as usual.

3 I slept about half my normal amount of time.

4 I slept less than 2 hours per night.

this lasted **MORE / LESS** than two weeks.

18) 0 I was not sleeping more than normal.

1 I occasionally slept more than usual.

2 I frequently slept at least 1 hour more than usual.

3 I frequently slept at least 2 hours more than usual.

4 I frequently slept at least 3 hours more than usual.

this lasted **MORE / LESS** than two weeks.

19) 0 I did not feel anxious, nervous, or tense.

1 I occasionally felt a little anxious.

2 I often felt anxious.

3 I felt anxious most of the time.

4 I felt terrified and near panic.

this lasted **MORE / LESS** than two weeks.

20) 0 I did not feel discouraged about the future.

1 I occasionally felt a little discouraged about the future.

2 I often felt discouraged about the future.

3 I felt very discouraged about the future most of the time.

4 I felt that the future was hopeless and that things would never improve.

this lasted **MORE / LESS** than two weeks.

- 21) 0 I did not feel irritated or annoyed.
1 I occasionally got a little more irritated than usual.
2 I got irritated or annoyed by things that usually didn't bother me.
3 I felt irritated or annoyed almost all the time.
4 I felt so irritated that I could not think about anything else.

this lasted **MORE / LESS** than two weeks.

- 22) 0 I was not worried about my physical health
1 I was occasionally concerned about bodily aches and pains.
2 I was worried about my physical health.
3 I was very worried about my physical health.
4 I was so worried about my physical health that I could not normally bother me.

this lasted **MORE / LESS** than two weeks.

Have you experienced any other times when you felt as bad as you did during this time?

Yes _____ No _____ -

If yes, please estimate the number of additional times: _____

Appendix D

Demographic Information

Please fill out the following information about yourself.

Age: _____

Sex: M_____ F_____

Ethnicity: ____African American
____Asian/Pacific Islander
____Caucasian
____Hispanic
____Other

Classification: ____Freshman ____Sophomore ____Junior ____Senior

Is English your first language?

Yes_____ No_____

Appendix E

Ruminative Response Scale

INSTRUCTIONS: Please read each of the items below and indicate how often, **within the past 2 weeks**, you have thought or done each one. Please indicate what you *generally* have done, not what you think you should do.

0=Almost Never

1=Sometimes

2=Often

3=Almost Always

- 0 1 2 3 1. Think about how alone I feel
- 0 1 2 3 2. Think "I won't be able to do my job if I don't snap out of this."
- 0 1 2 3 3. Think about my feelings of fatigue and achiness
- 0 1 2 3 4. Think about how hard it is to concentrate
- 0 1 2 3 5. Think "What am I doing to deserve this?"
- 0 1 2 3 6. Think about how passive and unmotivated I feel
- 0 1 2 3 7. Analyze recent events to try to understand why I am depressed
- 0 1 2 3 8. Think about how I don't seem to feel anything anymore
- 0 1 2 3 9. Think "Why can't I get going?"
- 0 1 2 3 10. Think "Why do I always react this way?"
- 0 1 2 3 11. Go away by myself and think about why I feel this way
- 0 1 2 3 12. Write down what I am thinking and analyze it
- 0 1 2 3 13. Think about a recent situation, wishing it had gone better
- 0 1 2 3 14. Think "I won't be able to concentrate if I keep feeling this way."
- 0 1 2 3 15. Think "Why do I have problems other people don't have?"
- 0 1 2 3 16. Think "Why can't I handle things better?"
- 0 1 2 3 17. Think about how sad I feel
- 0 1 2 3 18. Think about all my shortcomings, failings, faults, mistakes.
- 0 1 2 3 19. Think about how I don't feel up to doing anything
- 0 1 2 3 20. Analyze my personality to try to understand why I am depressed.
- 0 1 2 3 21. Go someplace alone to think about my feelings
- 0 1 2 3 22. Think about how angry I am with myself

Appendix F

Emotion Regulation Questionnaire

People have different ways of experiencing and handling emotions. Using the following 7 point scale, please answer the following questions about yourself by indicating the extent of your agreement:

[1] = strongly disagree [4] = neutral [7] = strongly agree

1. When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.
2. I keep my emotions to myself.
3. When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.
4. When I'm feeling positive emotions, I'm careful not to express them.
5. When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm.
6. I control my emotions by not expressing them.
7. When I want to feel more positive emotion, I change the way I'm thinking about the situation.
8. I control my emotions by changing the way I'm thinking about the situation I'm in.
9. When I'm feeling negative emotions, I'm careful not to express them.
10. When I want to feel more positive emotion, I change the way I'm thinking about the situation.

Appendix G

The Emotional Approach Coping Scales

We are interested in how people respond when they confront stressful experiences. By “stressful” we mean situations that are difficult or troubling to you, either because they upset you or because it takes considerable effort to deal with them. There are many ways to deal with stress. This questionnaire asks you to indicate what you generally do, feel, and think when you experience stressful situations. Obviously, different experiences may bring out different responses, but think about what you *usually* do when you are under a lot of stress.

	1	2	3	4	
	I usually don't			I usually do	
	do this at all			this a lot	
1	2	3	4	I take the time to figure out what I'm really feeling.	
1	2	3	4	I delve into my feelings to get a thorough understanding of them.	
1	2	3	4	I realize that my feelings are valid and important.	
1	2	3	4	I acknowledge my emotions.	
1	2	3	4	I work on understanding my feelings.	
1	2	3	4	I explore my emotions.	
1	2	3	4	I find a way to understand my emotions better.	
1	2	3	4	I look closely at the reasons for my feelings.	
1	2	3	4	I take time to express my emotions.	
1	2	3	4	I let my feelings come out freely.	
1	2	3	4	I allow myself to express my emotions.	
1	2	3	4	I feel free to express my emotions.	
1	2	3	4	I express the feelings I am having.	
1	2	3	4	I find a way to express my emotions.	
1	2	3	4	I let my feelings out.	
1	2	3	4	I get my feelings out in the open.	

Appendix H

Information about Physician Visits and Counseling

In the last 3 (1, 5) months, list the number of times you went to see a physician/specialist/nurse/nurse practitioner/counselor **for each of the following reasons:**

a) Acute illness (for example, cold, flu, etc.)

Number of times: _____

Reasons for visit(s) _____

Location (for example, University Health Center, primary physician, other)

b) Chronic condition/illness (for example, allergies, asthma, other long-term conditions or illnesses)

Number of times: _____

Reasons for visit(s) _____

Location (for example, University Health Center, primary physician, other)

c) Injury (for example, sports injury)

Number of times: _____

Reasons for visit(s) _____

Location (for example, University Health Center, primary physician, other)

d) Check-up (for example, physical, annual exam)

Number of times: _____

Reasons for visit(s) _____

Location (for example, University Health Center, primary physician, other)

e) Other (for example, Physical Therapy, other specialist visits)

Number of times: _____

Reasons for visit(s) _____

Location (for example, University Health Center, primary physician, other)

f) Over the last 3 (1, 5) months, have you sought psychotherapy/counseling?

Yes _____

No _____

Appendix I

Pennebaker Inventory of Limbic Languidness (PILL)

Several common symptoms or bodily sensations are listed below. Most people have experienced most of them at one time or another. On the page below, indicate how frequently you experience each symptom. For all items, use the following scale:

A	B	C	D	E
Have never or almost never experienced the symptom	Less than 3 or 4 times per year	Every month or so	Every week or so	More than once every week

For example, if you experience shortness of breath once every week or so, you would answer "D" next to question #1.

- ___ 1. Shortness of breath
- ___ 2. Racing heart
- ___ 3. Insomnia or difficulty sleeping
- ___ 4. Upset Stomach
- ___ 5. Abdominal Pain
- ___ 6. Congested Nose
- ___ 7. Headaches
- ___ 8. Chills
- ___ 9. Dizziness
- ___ 10. Hands tremble or shake
- ___ 11. Sore Throat
- ___ 12. Nausea

APPENDIX J

Negative Life Events Questionnaire (NLEQ)

INSTRUCTIONS: In this questionnaire we are interested in whether certain events have **happened to you since you first came in 6 months ago (Sept/Oct. 2003).** The questions can be answered by referring to the following scale:

A	B	C	D	E
NEVER	RARELY	SOMETIMES	FREQUENTLY	ALWAYS

Some questions do not follow this format. For these questions, a scale for answering will be provided after the question.

****If no scale is provided then use the scale at the top of the page.****

Please be careful to mark your answers correctly and you **are to evaluate each question for only the time since the first part of this experiment.**

A NEVER	B RARELY	C SOMETIMES	D FREQUENTLY	E ALWAYS	<i>Place Letter Here</i>
SCHOOL					
1. Did poorly on, or failed, an exam or major project in an important course (i.e. grade less than or equal to a C.)					
2. Received a negative reaction from family or friends about not doing well in school (e.g. got the silent treatment, got criticized)					
3. Doing worse academically than I usually did in previous semesters or than I did in high school (difference of at least one grade; e.g. C rather than a B.)					
4. Negative consequences from studying for long periods of time (e.g. exhaustion, ill health, loss of friends, etc.)					
5. Do not have time to do well in school or job (e.g. work long hours so have no time to study.)					
6. Dislike school in general, but have to stay (e.g. forced by parents to stay, have no skills to get a job, etc.)					
7. Not doing as well in school as would like					
JOB					
8. Laid off or fired from job A=NO B=YES					
9. Unable to find work and need a job very much for financial or other reasons					
10. Reprimanded at work					
11. Significant negative change in financial circumstances (e.g. large amount of money or valuables lost or stolen, significant decrease in financial support, etc.)					
12. Did not have enough money for one or more necessities and had to do without them (or, when living with family, family did not have money for one or more necessities) (necessities are: health care, food, housing or necessary clothing.)					
ACHIEVEMENT					
13. Have not been achieving or accomplishing as much as I would like					
14. Parents upset with me for not living up to their standards/expectations (e.g. not doing well in school, sports, etc.)					
PARENTS AND FAMILY					
15. Significant fight or argument with close family member that led to serious consequences (such as self or family member crying, temporary loss of privileges, emotional distance, etc.)					
16. Close family member became so upset with you that s/he ended the relationship					
17. Trying but can't seem to fully please mother and/or father					

A NEVER	B RARELY	C SOMETIMES	D FREQUENTLY	E ALWAYS	<i>Place Letter Here</i>
18. Can't tell how family member really feels about you					
19. Trying but can't seem to get close to one or more family members					
20. Did something you did not want to do in order to please family member					
21. Death of parent, brother, or sister A=NO B=YES					
22. Found out that close family member has been criticizing you behind your back					
23. Fights or disagreements with one or more close family members					
24. Put down by parents or parents show dislike					
25. Parents disappointed in you					
26. Family member has significant medical or emotional problem (e.g. heart disease, depression, excessive use of alcohol or drugs, etc.)					
27. Family member has a life threatening illness A=NO B=YES					
28. Conflicts with parents over (or parents do not support) personal goals, desires, or choice of friends					
29. Did not receive love, respect, or interest from parents (e.g. did not receive compliments or praise from parents, parents did not call or write, parents did not listen or show interest, etc.)					
30. Forced by parents to achieve things that could not or did not want to achieve (e.g. have to be a star athlete though would rather concentrate on other interests, punished if do not excel in everything undertaken, etc.)					
31. Close family member has been withdrawing affection from you					
ROOMMATES					
32. Trying but can't seem to fully please roommate					
33. Criticized by one or more roommates					
34. Can't tell how one or more roommates really feels about you					
35. Trying but can't seem to get close to one or more roommates					
36. Did something you did not want to in order to please roommate					
37. Found out that roommate has been criticizing you behind your back					
38. Fight or disagreement with one or more roommates					
39. Roommate has been withdrawing affection from you					
FRIENDS (OTHER THAN ROOMMATES)					
40. Close friend becomes so upset with you that s/he ends the relationship					
41. Trying but can't seem to fully please a friend					
42. Criticized by one or more friends					
43. Can't tell how one or more friends really feels about you					
44. Trying but can't seem to get close to one or more friends					
45. Found out that friend had been criticizing you behind your back					
46. Death of a pet A=NO B=YES					
47. Death of a friend A=NO B=YES					
48. Have hardly any friends					
49. Not sought out by others for activities or friendships (e.g. not called by others and asked to do something fun, etc.)					
50. Close friend has been withdrawing affection from you					

A NEVER	B RARELY	C SOMETIMES	D FREQUENTLY	E ALWAYS	<i>Place Letter Here</i>
BOYFRIEND/GIRLFRIEND/SPOUSE					
51. Significant fight or argument with boyfriend/girlfriend/spouse that led to serious consequence(s) such as self or boyfriend/girlfriend/spouse crying, leaving common residence for one night, etc.)					
52. Boyfriend/girlfriend/spouse ends the relationship					
53. Boyfriend/girlfriend/spouse says s/he is not sure whether wants relationship to continue					
54. Trying but can't seem to fully please boyfriend/girlfriend/spouse					
55. Criticized by boyfriend/girlfriend/spouse					
56. Trying but can't seem to get close to boyfriend/girlfriend/spouse					
57. Found out that boyfriend/girlfriend/spouse has been criticizing you behind your back					
58. Discovered boyfriend/girlfriend/spouse has been cheating on you					
59. Did something you did not want to do in order to please boyfriend/girlfriend/spouse					
60. While still involved with boyfriend/girlfriend/spouse s/he has a date with someone else					
61. Death of a boyfriend/girlfriend spouse A=NO B=YES					
62. Fight or disagreement with boyfriend/girlfriend/spouse					
63. Can't tell how boyfriend/girlfriend/spouse really feels about you					
64. Want a boyfriend/girlfriend/spouse but do not have one					
65. Did not receive love, respect, or interest from boyfriend/girlfriend/spouse (e.g. did not receive compliments or praise, boyfriend/girlfriend/spouse did not listen or take interest in you, etc.)					
66. Boyfriend/girlfriend/spouse withdrew affection from you					

Appendix K

Participants' Experience of the Study (Time 3)

Now, please think back about this experiment.

1. Since your participating in the writing experiment, how much have you thought about what you wrote?

1	2	3	4	5	6	7
not at all						a great deal

2. Since the writing experiment, how much have you talked to other people about what you wrote?

1	2	3	4	5	6	7
not at all						a great deal

3. Looking back on the experiment, to what degree do you feel that the experiment had a positive long-lasting effect on you?

1	2	3	4	5	6	7
not at all						a great deal

4. Looking back on the experiment, to what degree do you feel that the experiment had a negative long-lasting effect on you?

1	2	3	4	5	6	7
not at all						a great deal

5. Since the experiment, how happy have you felt?

1	2	3	4	5	6	7
not at all						a great deal

6. Since the experiment, how sad or depressed have you felt?

1	2	3	4	5	6	7
not at all						a great deal

7. Looking back on the experiment, to what degree has this experiment been valuable or meaningful for you (not counting the class credit and money you will receive)?

1	2	3	4	5	6	7
not at all						a great deal

8. (Booster Conditions ONLY) Looking back on the extra writing session you completed 5 weeks after your first three writing session, to what degree did you find it valuable or meaningful to write again at that point in time?

1	2	3	4	5	6	7
not at all						a great deal

9. If you had the chance to do it over again, would you participate in this study:
definitely yes_____ probably yes_____ don't know_____ probably no_____ definitely no_____

10. Now that the experiment is completed, could you tell us how it may have influenced you in the long run? What have been the positive effects as well as the negative effects?

11. Any other comments you have about the experiment would be greatly appreciated.

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