

NARRATIVE CONTENT IN POSITIVE AND NEGATIVE WRITTEN  
EMOTIONAL EXPRESSION AND LONG-TERM IMPROVEMENTS  
IN MOOD, SELF-COGNITIONS, AND PSYCHOLOGICAL  
SYMPTOMATOLOGY IN SURVIVORS OF TRAUMA

by

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## ABSTRACT

The present study investigated the relationship between narrative content in positive and negative written emotional expression and long-term improvements in mood, cognitions, and psychological symptomatology in 148 individuals who have experienced a severe trauma. Although the writing exercises were experienced differentially, they did not yield differential results. The higher level of distress experienced by participants in the current study may have been largely unresponsive to both the positive and negative writing interventions. Despite the lack of evidence supporting the hypothesized improvements in long-term functioning, results of the current study did support proposed hypotheses regarding the differential use of emotion words between groups. Those who wrote about negative life events used a greater percentage of negative emotion words, while those who wrote about positive life events used a greater percentage of positive emotion words. Those who wrote about negative and positive life events also used a higher percentage of cognitive words overall, fewer words over time, and an increased percentage of insight words and first-person pronouns over time when compared to the neutral writing group. The changes in word use over time are thought to be reflective of individuals' attempts to make sense of, or gain a better understanding of, significant life events. None of the proposed hypotheses regarding narrative features which were thought to be associated with greater degrees of improvement in long-term mood, self-cognitions, and psychological functioning were supported. Statistical issues, the high level of initial distress in the experimental participants, and the insensitivity of the word-count program appear to be largely responsible for this outcome. Qualitative examination revealed several features which were associated with greater and lesser degrees of improvement in the two experimental groups, suggesting several limitations in the word-count program.

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## CHAPTER I

### INTRODUCTION

Psychologists have long been interested in the effects of emotional inhibition and expression on long-term physical and psychological health. Both historical and recent literature suggests that the expression of emotionally-laden material is beneficial for overall health, while emotional inhibition may be detrimental to health. Over the past decade, several researchers have examined the effects of emotional disclosure of negative or traumatic events on short- and long-term physical and psychological health. These studies have found that both written and oral disclosure of personal negative life events contributes to mild increases in immediate physiological and emotional stress followed by long-term improvements in health and mood.

In recent years, Pennebaker and other investigators have studied the effects of emotional expression of negative events on several physiological and psychological processes. With respect to the immediate effects of writing about negative events, physiological responses have included initial increases in skin conductance level (Hughes, Uhlmann, & Pennebaker, 1994; Pennebaker, Hughes, & O'Heeron, 1987) and cardiovascular activity (Pennebaker et al., 1987). Immediate psychological responses include an increase in negative mood (Murray, Lamnin, & Carver, 1989; Pennebaker & Beall, 1986; Petrie, Booth, Pennebaker, Davison, & Thomas, 1995; Wagner & Harter, 1998).

Although emotional expression of personal experiences of trauma leads to negative consequences in the short-term, such disclosure appears to yield long-term benefits both physiologically and psychologically. For example, written disclosure of negative events has been found to be associated with fewer health center visits (Pennebaker & Beall, 1986; Pennebaker, Colder, & Sharp, 1990; Pennebaker &

Francis, 1996; Pennebaker, Kiecolt-Glaser, & Glaser, 1988) and self-reported illness (Greenberg & Stone, 1992; Pennebaker & Beall, 1986), better physical functioning in patients with rheumatoid arthritis (Kelley, Lumley, & Leisen, 1997), and beneficial influences on immune function, including antibody response to Epstein-Barr virus (Esterling, Antoni, Fletcher, Marguiles, & Sneiderman, 1994) and antibody response to Hepatitis B vaccinations (Petrie et al., 1995). Emotional expression of negative events has also been found to contribute to long-term improvements in grade point average (Pennebaker et al., 1990; Pennebaker & Francis, 1996), faster re-employment following job termination (Spera, Buhrfeind, & Pennebaker, 1994), and higher levels of positive mood and psychological well-being (Pennebaker et al., 1990; Pennebaker et al., 1988; Wagner & Harter, 1998). These long-term effects have been further supported by the results of a recent meta-analysis conducted by Smyth (1998) which suggests that written emotional expression of negative life events consistently yields long-term improvements in physical health, psychological well-being, physiological functioning, and general functioning.

The recent proliferation of research conducted within this area has yielded various hypotheses which attempt to explain the long-term improvements in physical and psychological health following written disclosure of personal negative life events. Although several hypotheses were initially proposed, most were disproved through subsequent research. For example, researchers initially believed that those who exhibited improvements in physical and psychological health may have been writing about different topics than were those who did not improve. However, content analysis suggested that there was not a strong correlation between the category of negative event disclosed (i.e., having disagreement with roommate, earning poor grade on exam) and any health or behavioral outcome measures (Pennebaker, 1993). An alternative hypothesis suggested that the beneficial effects of emotional disclosure of traumatic

events can be attributed to a shift to healthier behaviors or lifestyles following disclosure. However, subsequent research indicated that, following disclosure of traumas, people tend to continue drinking, smoking, exercising, and sleeping at rates comparable to control subjects (Pennebaker, 1993). A third hypothesis asserted that the ways by which trauma-relevant events are represented in memory or consciousness may be changed following disclosure of the event through writing. Although this has been a difficult hypothesis to test, one study looked at reaction time to event-related material and found no differences between experimental and control subjects (Pennebaker, 1993).

There are currently two predominant theories which are thought to account for the long-term health benefits of writing about negative events. The original theory, which has motivated much of the research in this area, was Pennebaker's Inhibition-Confrontation theory. This theory draws upon both cognitive and personality perspectives and is based on the assumption that active inhibition of important psychological phenomena is a form of work that ultimately contributes to physiological and psychological stress. Specifically, this theory starts with the premise that people are reluctant to share with others upsetting or traumatic experiences for fear of embarrassment, disapproval, or punishment. Thus, they actively inhibit their desire to disclose significant traumatic events. This active inhibition is a form of psychological work that adversely affects autonomic and central nervous system activity. Over time, this long-term low-level stressor places cumulative stress upon the body which causes and/or exacerbates psychosomatic processes, thereby increasing the probability of stress-related diseases and emotional disorders (Selye, 1976). Based on this theory, disclosure of the traumatic event reduces inhibition as well as the cumulative physiological and emotional stress caused by this inhibition, promoting improved physical and emotional health (Pennebaker et al., 1990).

Although much research has supported the idea that emotional inhibition contributes to long-term negative health consequences, evidence supporting the idea that disclosure reduces inhibition and thereby leads to improvements in health is lacking. For example, Greenberg and Stone (1992) found that individuals who wrote about previously-disclosed traumatic events derived as much benefit from the exercise as did individuals who wrote about previously-undisclosed traumatic events. Thus, it appears as though writing about traumatic events, regardless of whether the details of the events have been actively inhibited, yields long-term health benefits. At this point, then, the precise role of inhibition and its influence on health within the writing paradigm is unclear.

Weaknesses in the Inhibition-Confrontation hypothesis have inspired Pennebaker and others in more recent years to consider alternative mechanisms which may be involved in the production of positive long-term change following written disclosure of negative life events. This interest in identifying other components which may contribute to long-term change has led Pennebaker and colleagues to begin analyzing the style of language used by individuals while writing about emotional traumas. Content analysis of narratives from several studies suggests that the act of constructing an organized and coherent narrative (reflecting changes in thinking patterns), rather than having a narrative per se (reflecting static thinking patterns, which may be construed as rumination), is crucial for recovery. Specifically, Pennebaker and colleagues (Pennebaker & Francis, 1996; Pennebaker, Mayne, & Francis, 1997) have found that an increased number of insight-related and causal words from the first to the last day of writing is consistently related to improvements in long-term functioning. Additional findings suggest that greater use of positive emotion words has been linked to maximal health benefits (Pennebaker & Francis, 1996; Pennebaker et al., 1997). Although the findings have been somewhat inconsistent with regard to the use of

negative emotion words, results of recent studies suggest that their use in moderation is predictive of better health, but that both very high and very low levels of negative emotion words are correlated with poorer health (Pennebaker et al., 1997).

Based on these findings, Pennebaker and colleagues have hypothesized that the essential component in long-term physiological and psychological improvement may be the cognitive change associated with writing about negative or traumatic events (Pennebaker, 1997). Specifically, it is believed that linguistically labeling an event and its emotions forces the experience to be structured. In other words, translating traumas and their accompanying images and emotions into language demands that all features of the experience be encoded and stored in a more organized, coherent, and simplified manner. This structure is thought to promote assimilation and understanding of the event and reduce the associated emotional arousal, thereby leading to physiological change (Pennebaker et al., 1997).

In an effort to test the validity of each of the two predominant hypotheses proposed by Pennebaker and colleagues, several studies have examined the effects of writing about negative or traumatic events on long-term physiological and psychological health (Donnelly & Murray, 1991; Esterling et al., 1994; Greenberg & Stone, 1992; Kelley et al., 1997; Murray et al., 1989; Pennebaker, 1993; Pennebaker & Beall, 1986; Pennebaker et al., 1990; Pennebaker & Francis, 1996; Pennebaker et al., 1997; Petrie et al., 1995; Spera et al., 1994). However, with few exceptions (Greenberg & Stone, 1992; Wagner & Harter, 1998), the writing intervention has been used primarily with individuals who have experienced mild to moderate degrees of stress related to events such as going away to college or losing one's job rather than with individuals who have experienced a severely traumatic event which "involved exposure to actual or threatened death or serious injury" or that "threatened to physically or psychologically shatter" the individual or someone close to the individual.

Tests of these hypotheses also have not yet considered the possibility that written disclosure of any powerful life event, whether negative or positive, may stimulate meaning-making processes and lead to cognitive reformulations that benefit health. Cognitive-behavioral theorists postulate that how one feels and behaves is largely determined by the nature of one's cognitions and related behaviors. Specifically, this theory asserts that depressed mood is largely the result of negative and pessimistic cognitions and that alleviation of depression is possible through modification of negative cognitions to more positive ones, a change from negative to more positive, pro-active behaviors, and an increase in the ratio of pleasurable to negative events (e.g., Beck, 1967; Ellis & Grieger, 1977; Lewinsohn, Biglan, & Zeiss, 1976). Based on this theory, then, it is possible that writing at length about very positive events, which may have marked a turning point in one's life, may be even more beneficial to one's physical and emotional health than writing about negative events.

In an effort to determine the potential benefits of disclosing positive or traumatic events on overall emotional health in trauma survivors, Wagner and Harter (1998) examined the immediate and long-term effects of writing about positive, negative, or neutral experiences on mood, cognitions, and psychological symptoms in individuals who had experienced a severe trauma. Although previous research had not directly tested the effects of writing about positive life experiences, mood-induction researchers have provided related information. Specifically, several studies have examined the effects of inducing elation versus depression by means of having the participant read either positive or negative self-statements (Madigan & Bollenbach, 1986; Velten, 1968) or think about happy or sad events in their lives for several minutes (Baker & Guttfreund, 1993). The results of each of these studies suggested that individuals in the elation-induced group exhibited more positive mood, while those

in the depression-induced group exhibited more negative mood immediately following induction. However, questions which had not been addressed by previous research and were therefore addressed by Wagner and Harter, are whether these mood changes are long-term and whether inducing an elated mood in those who have experienced traumatic events is beneficial for long-term physiological and psychological health.

Based on cognitive-behavioral theory (e.g., Beck, 1967; Ellis & Grieger, 1977; Lewinsohn et al., 1976) and research which has examined the immediate effects of mood induction (Baker & Gutfreund, 1993; Madigan & Bollenbach, 1986; Velten, 1968), it was hypothesized that individuals who wrote about positive events would exhibit more positive mood immediately following writing exercises. It was also believed that this writing activity would result in long-term improvements in mood, cognitions, and psychological symptomatology. Furthermore, it was anticipated that those who wrote about negative events would demonstrate immediate and long-term characteristics similar to those found in previous studies which have examined these effects (Esterling et al., 1994; Murray et al., 1989; Pennebaker & Beall, 1986; Pennebaker et al., 1990; Pennebaker et al., 1987; Pennebaker et al., 1988). Specifically, it was hypothesized that these individuals would exhibit more negative mood immediately following writing exercises, but would demonstrate long-term improvements in mood, cognitions, and psychological symptomatology. Extending previous research, it was further anticipated that writing about negative events would result in more long-term benefits than writing about positive events.

Although results obtained by Wagner and Harter (1998) supported proposed hypotheses regarding the immediate effects of writing about positive or negative events on mood, the results were only partially consistent with previous studies which have tested the theories proposed by Pennebaker. Specifically, Wagner and Harter found that writing about negative experiences was associated with long-term improvements in

mood, cognitions, and psychological symptomatology. However, these improvements were no more pronounced than those exhibited by individuals who wrote about positive or neutral events. In fact, individuals in all experimental conditions examined in this study, including the control condition (Neutral Writing condition), demonstrated long-term improvements.

The results obtained by Wagner and Harter (1998) suggested that some common factor to which all individuals in the study were exposed may have been responsible for the similarity in outcome measures of mood, cognitions, and psychological symptomatology across experimental conditions. The most significant methodological difference between the study conducted by Wagner and Harter and previous studies which have found long-term health improvements following written disclosure about negative events (Pennebaker & Beall, 1986; Pennebaker et al., 1988, 1990) was the inclusion of self-report mood measures by Wagner and Harter prior to and following each of the three writing sessions. This mood monitoring was a common factor across experimental conditions that may have contributed to improvements in mood, self-cognitions, and symptomatology. This phenomenon, referred to as "self-monitoring reactivity," has been observed in both experimental and clinical settings for many years. For example, Nelson (1977) suggested that an individual's awareness of and reactivity to the self-monitored target behavior may result in positive behavioral change. Similarly, Bornstein, Hamilton, and Bornstein (1986) found that when individuals are instructed to observe and record the occurrence of a target behavior, often the activity of recording alone is sufficient to reduce the behavior.

This self-monitoring reactivity has also been demonstrated to be effective as a form of treatment within clinical settings. In a study which examined the effects of self-monitoring on suicidal ideation, Clum and Curtin (1993) found that individuals who had previously reported chronic suicidal ideation exhibited a significant decrease

in the prevalence of these thoughts following several weeks of self-monitoring. In their study, it appeared as though self-monitoring served as a feedback device which promoted increased awareness of individuals' suicidal thoughts relative to specific circumstances. Similarly, in the study conducted by Wagner and Harter (1998), the monitoring of one's own mood may have promoted an increased awareness of mood states followed by a decrease in maladaptive negative moods and increases in positive moods and cognitions. Based on cognitive-behavioral theory (e.g., Beck, 1967; Ellis & Grieger, 1977; Lewinsohn et al., 1976), these changes to more positive mood and self-cognitions would then be expected to contribute to decreased psychological symptomatology.

The current study used a comparative outcome design in an effort to determine the long-term effects of disclosing emotions surrounding either positive or negative events on negative (defined here as depression, anxiety, and hostility) and positive (defined as happy, enthusiastic, active, and alert) affect; negative and positive cognitions about oneself; and psychological symptom distress and well-being. Because past research has found that persons who disclose more severe traumas, compared with low-severity traumas, exhibit more profound physical improvements in the months following disclosure (Greenberg & Stone, 1992), this study was conducted with persons who have experienced what they rate as a severely traumatic event (greater than or equal to a score of 7 on a 10-point Likert scale).

The study conducted by Wagner and Harter (1998) clearly demonstrated that their writing exercises created the expected specific immediate effects on mood. Thus, the current study used the same basic instructions as did Wagner and Harter for each of the Positive, Negative, and Neutral Writing groups. However, in order to test whether cognitive reformulation of a particular event is essential for long-term improvements in mood, self-cognitions, and psychological symptomatology, participants in the current

study were instructed to write about the same event on all three writing days (rather than being given the option to write about the same or different events on each of the three writing days). In addition, measures of mood prior to and following each writing exercise were omitted from the current study as it was believed that the elimination of any self-monitoring effect associated with this repeated measurement of mood would yield a more powerful test of the long-term effects of positive, negative, and neutral writing exercises on mood, cognitions, and psychological symptomatology. The hypotheses for the present study were as follows:

1. Generalizing from cognitive-behavioral theory, it was hypothesized that participants exposed to the Positive Writing condition would exhibit more positive mood, more positive self-cognitions, and greater psychological well-being as well as less negative mood, fewer negative self-cognitions, and fewer psychological symptoms two weeks, six weeks, and three months following writing exercises when compared to their pre-treatment measures and to the Neutral Writing condition.
2. Consistent with past research examining the theories proposed by Pennebaker, it was hypothesized that participants exposed to the Negative Writing condition would report more positive mood, more positive self-cognitions, and greater psychological well-being as well as less negative mood, fewer negative self-cognitions, and fewer psychological symptoms two weeks, six weeks, and three months following writing exercises when compared to their pre-treatment measures and to the Positive and Neutral Writing conditions.
3. Based on a recent study which suggests that there may be an even stronger "delayed" effect of disclosure of negative events on physical and affective functioning (Kelley et al., 1997), it was hypothesized that the improvements in mood, self-cognitions, and psychological symptoms would be more pronounced for the Negative Writing condition at three-month follow-up than at six-week follow-up. In addition, it

was hypothesized that the improvements in mood, self-cognitions, and psychological symptoms would be more pronounced from six-week to three-month follow-up for the Negative Writing condition than for the Positive and Neutral Writing conditions.

4. Content analysis of narratives allowed for an examination of the differential use of emotion words (positive and negative), total number of words, insight-related and causal words, and first-person and third-person pronouns across conditions as well as changes in their use over time. Consistent with the basic task assigned to each of the three writing conditions, it was hypothesized that narratives written by the Positive Writing condition would evidence a greater percentage of positive emotion words (Positive feelings and Optimism) when compared to the Negative and Neutral Writing conditions. Narratives written by the Negative Writing condition would evidence a greater percentage of negative emotion words (Anxiety, Anger, and Sadness) when compared to the Positive and Neutral Writing conditions.

5. Due to the meaning-making nature of constructing narratives related to negative or positive life events, it was hypothesized that those in the Negative and Positive Writing conditions would use a higher percentage of causal and insight-related words than would those in the Neutral Writing condition. Based on the nature of the task (write about what you have done over the past 24 hours), it was hypothesized that narratives written by the Neutral Writing condition would evidence a higher percentage of first-person pronouns and a lower percentage of third-person pronouns when compared to those written by the Negative and Positive Writing conditions. Based on studies which suggest that trauma survivors tend to de-emphasize the central role of the self (Klein & Janoff-Bulman, 1996) in the telling of their stories, it was hypothesized that those in the Negative and Positive Writing conditions would use a lower percentage of first-person pronouns and a higher percentage of third-person pronouns when compared to those in the Neutral Writing condition.

6. With regard to changes in the use of words over time, it was hypothesized that the total number of words used would decrease across writing sessions for those in the Negative and Positive Writing conditions, as their stories will likely become more integrated with repetition. It was further hypothesized that the meaning-making process of constructing narratives related to negative or positive life events would result in an increasing percentage of causal words, insight words, and first-person pronouns and a decreasing percentage of third-person pronouns across writing sessions for those in the Negative and Positive Writing conditions.

7. In an effort to examine the narrative features which are associated with improvements in mood, self-cognitions, and psychological symptoms, post-hoc analyses grouped individuals within each writing condition into two categories based on level of improvement (those who improved the most versus those who improved to a lesser extent or not at all). It was hypothesized that those within the Negative Writing condition who improved the most would be more engaged in the task and therefore use a greater number of overall words when compared to those in the Negative Writing condition who showed little or no improvement. It was further hypothesized that those who improved most would more successfully integrate their experiences, thus demonstrating a more pronounced decrease in the number of words used across writing sessions when compared to those who did not improve. Based on findings by Pennebaker and colleagues (Pennebaker & Francis, 1996; Pennebaker et al., 1997), it was hypothesized that those in the Negative Writing condition who improved the most would use a greater percentage of emotion words (positive and negative) overall, with the number of negative emotion words being moderate, and an increasing percentage of insight-related and causal words over the course of writing when compared to those in the Negative Writing condition who improved to a lesser extent or did not improve at all. Based on the belief that regaining a sense of control over negative outcomes is

important in recovery from trauma (Janoff-Bulman, 1992), it was hypothesized that those in the Negative Writing condition who demonstrated the most improvement would use a greater percentage of first-person pronouns and fewer third-person pronouns overall when compared to those in the Negative Writing condition who evidenced little or no improvement.

8. It was hypothesized that those within the Positive Writing condition who improved the most would be more engaged in the task and therefore use a greater number of overall words when compared to those in the Positive Writing condition who showed little or no improvement. It was further hypothesized that those who improved most would more successfully integrate their experiences, thus demonstrating a more pronounced decrease in the number of words used across writing sessions when compared to those who did not improve. Based on cognitive-behavioral theory (e.g., Beck, 1967; Ellis & Grieger, 1977; Lewinsohn et al., 1976), it was hypothesized that those who improved the most within the Positive Writing condition would use a greater percentage of positive emotion words and fewer negative emotion words overall when compared with those in the Positive Writing condition who demonstrated little or no improvement. It was further hypothesized that those evidencing the most improvement within the Positive Writing condition would likely have used more successful meaning-making strategies, resulting in a greater percentage of insight-related and causal words as well as a greater percentage of first-person and fewer third-person pronouns across writing sessions when compared with those in the Positive Writing condition who evidenced little or no improvement.

## CHAPTER II

### METHODS

#### Participants

Participants were 154 volunteers from the undergraduate PSY 1300 subject pool, initially recruited through the Mass Survey procedures. A Trauma Survey (TS) was included in the Mass Survey in order to screen for individuals who had experienced a traumatic event. Subjects indicating a willingness to participate in further research were invited to participate in the experimental portion of this study based upon reporting a traumatic event between 12 and 2 years previously that they rated as severe (7-10 on a Likert scale) on the Trauma Survey. In order to exclude those who experienced an event for which they may have developed no verbal representation and those who are still in the more acute stages of recovery, only those individuals reporting such an event within the last 2-12 years were considered. Furthermore, individuals must not have received psychological treatment for traumatic events, as participation in psychotherapy may result in cognitive processing, reformulation, and resolution of the event, thereby leading to improved physical and psychological health.

The 154 experimental participants ranged in age from 17-35, with a mean age of 19 and a modal age of 18. Sixty-three percent of the sample was female, while 37% was male. Of the 154 participants, 76% was White, non-Hispanic, 16% was Hispanic, 5% was Asian, 1% was Black, and 2% was of the category "Other." Frequency of occurrence and mean ratings of traumatic events experienced by the participants were computed and grouped according to type of trauma. These results are presented in Table 1.

In an effort to establish the experimental participants as "distressed," those who participated in the current study were compared with those who have participated in previous studies (nondistressed or mildly distressed college students who participated in a similar study by Pennebaker et al. [1990] as well as those who participated in the normative studies for the outcome measures) on measures of pre-treatment mood, self-cognitions, and psychological symptomatology. Those who participated in the current study evidenced a significantly greater degree of negative affectivity when compared with the samples studied by Pennebaker et al. (1990),  $t(276) = -13.95$ ,  $p < .001$ , and Watson, Clark, and Tellegen (1988),  $t(852) = -22.31$ ,  $p < .001$ . The current study also evidenced fewer positive self-cognitions (cf. Janoff-Bulman, 1989),  $t(401) = 21.33$ ,  $p < .001$ , a greater number of negative self-cognitions (cf. Hollon & Kendall, 1980),  $t(458) = -8.65$ ,  $p < .001$ , and a greater degree of anxiety,  $t(196) = -74.31$ ,  $p < .001$ , depression,  $t(196) = -84.06$ ,  $p < .001$  somatic complaints,  $t(196) = -81.32$ ,  $p < .001$  and hostility,  $t(196) = -70.29$ ,  $p < .001$  (cf. Kellner, 1987). The level of positive affectivity endorsed by the current sample was not significantly different from that observed in the sample studied by Watson and colleagues (1988),  $t(852) = 1.04$ ,  $p > .05$ ; however, interestingly, it was significantly greater than in the sample studied by Pennebaker et al. (1990),  $t(276) = -4.24$ ,  $p < .001$ . The degree of relaxation,  $t(196) = -13.05$ ,  $p < .001$ , contentedness,  $t(196) = -9.05$ ,  $p < .001$ , somatic well-being,  $t(196) = -24.52$ ,  $p < .001$ , and friendliness,  $t(196) = -6.9$ ,  $p < .001$ , were also greater in the current sample when compared with the normative sample (Kellner, 1987).

### Procedure

The first session was conducted in a group format that lasted approximately 40 minutes, at which time participants completed a brief demographic questionnaire and

pre-treatment measures of mood, self-cognitions, and psychological symptomatology and well-being. Participants were assigned to small groups of five for the writing sessions (based upon scheduling availability). In order to ensure equal proportions of male and female participants in each of the three writing conditions, each small writing group was composed of a similar male to female ratio. Assignment of small groups to the Negative, Positive, or Neutral Writing condition was counterbalanced. Following attrition that occurred throughout the 7-week-long study (3 participants were unable to coordinate their schedules with that of the experimenter, 2 participants no longer needed the extra credit points, and 1 participant withdrew from the course for which he was receiving extra credit), this yielded 50 participants (19 male, 31 female) in the Negative Writing condition, 49 participants (17 male, 32 female) in the Positive Writing condition, and 49 participants (19 male, 30 female) in the Neutral Writing condition.

The writing exercises started within three weeks of completing pre-treatment measures. At the start of each of the three writing sessions, the experimenter gave both verbal and written instructions for the writing assignment, gave each participant a clipboard and blank pages on which to write, and assigned participants to individual rooms for the writing exercises. After completing the 15 minute writing exercise, participants placed all written material within a confidential "ballot box."

The instructions given to the Negative Writing condition were derived from Pennebaker et al. (1988, 1990). Individuals assigned to this group were given the following instructions:

During each of the three writing days, I want you to write about the most traumatic and upsetting experience of your entire life. You are to write about the same event for all three days and it is important that you write about your deepest thoughts and feelings about the event. In other words, write about what happened, how you felt about it then, and how

you feel about it now. You will have 15 minutes. Please continue writing until I tell you that your time is up.

Participants assigned to the Positive Writing condition were given similar instructions to those given to the Negative Writing condition except that the following sentence was substituted for the first line of the instructions: "During each of the three writing days, I want you to write about the happiest experience of your entire life." Those assigned to the control, or Neutral Writing, condition spent each of the three writing sessions writing about a neutral event, namely a description of their activities for the past 24 hours. Subjects in this condition were given similar instructions to those given to Pennebaker et al.'s (1990) neutral condition. They were told to keep their descriptions as factual and objective as possible and to write about facts or data, not about their own feelings or emotions about the event. The three writing sessions were spaced so that one day lapsed between each.

Group follow-up sessions were conducted 2 weeks and 6 weeks after the conclusion of the writing sessions. The measures of mood, self-cognitions, and psychological symptom distress and well-being were repeated at those times.

Measures of mood, self-cognitions, and psychological symptomatology were also mailed to 81 participants who volunteered to continue participation in the study three months after the conclusion of the writing sessions. Participants were provided with postage-paid return envelopes and were encouraged to return the completed measures in order to be included in a raffle for prizes. Of the 81 individuals who were contacted for the 3-month follow-up component of the study, 34 questionnaire packets were completed by participants and returned to the experimenter. Of those who returned the questionnaire packets, 13 respondents had initially participated in the Negative Writing condition, 10 had participated in the Positive Writing condition, and 11 had participated in the Neutral Writing condition.

In an effort to determine whether those who participated in the three-month follow-up differed at pre-treatment from those who did not participate in this portion of the study, two MANOVA's were performed (one containing pre-treatment measures of positive functioning as dependent variables: PANAS-PA, WAS, SQ-POS and one containing pre-treatment measures of negative functioning as dependent variables: PANAS-NA, ATQ, SQ-NEG). The between-subjects factors were experimental condition (Negative Writing, Positive Writing, Neutral Writing) and completion status (Completors and Non-completors).

Analyses of the relationship between experimental condition, completion status, and measures of pre-treatment positive mood, positive self-cognitions, and psychological well-being revealed no significant main effect of completion status, Wilks'  $\Lambda = .99$ ,  $F (3, 140) = .620$ ,  $p = .603$ , effect size = .013, indicating that the level of the profiles did not differ between completion status groups. Analyses further revealed no condition x completion status interaction, Wilks'  $\Lambda = .92$ ,  $F (6, 280) = 1.87$ ,  $p = .086$ , effect size = .039. Thus, level of positive pre-treatment functioning did not differ based on completion status, whether overall or between experimental groups.

Analyses of the relationship between experimental condition, completion status, and measures of pre-treatment negative mood, negative self-cognitions, and psychological symptomatology also revealed no significant main effect of completion status, Wilks'  $\Lambda = .99$ ,  $F (3, 140) = .441$ ,  $p = .724$ , effect size = .009, and no significant condition x completion status interaction, Wilks'  $\Lambda = .94$ ,  $F (6, 280) = 1.47$ ,  $p = .190$ , effect size = .030.

Measures of mood were administered in the 1st, pre-treatment session; in the 5th, 2-week follow-up session; in the 6th, 6-week follow-up session; and at 3 months

post-writing. Levels of positive and negative mood were assessed by the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988).

Measures of positive and negative self-cognitions were administered in the 1st, pre-treatment session; in the 5th, 2-week follow-up session; in the 6th, 6-week follow-up session; and at 3 months post-writing. They included portions of the World Assumptions Scale related to positive Self-Worth (Self Assumptions, WAS; Janoff-Bulman, 1989) and the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980), which measures negative self-cognitions.

Psychological well-being and symptomatology were assessed by the Symptom Questionnaire (SQ; Kellner, 1987), which was administered in the 1st, pre-treatment session; in the 5th, 2-week follow-up session; in the 6th, 6-week follow-up session; and at 3 months post-writing.

At the conclusion of the study, all narratives were analyzed with the Second Linguistic Inquiry and Word Count computerized text analysis program (SLIWC; Pennebaker & Francis, 1996, 1998). For each of the three narratives written by a participant, the SLIWC program computed the number of total words used as well as the percentage of words related to (a) Positive feelings (b) Optimism and energy, (c) Anxiety or fear, (d) Anger, (e) Sadness or depression, (f) Insight (g) Causation, (h) First-person pronouns, and (I) Third-person pronouns.

### Measures

#### Positive and Negative Affect Schedule (PANAS)

This questionnaire contains 20 factor-analytically derived mood descriptors (e.g., active, excited, hostile) which are indicative of either high negative affect (NA) or high positive affect (PA; Watson et al., 1988). Participants are to rate, from 1 = "very slightly or not at all" to 5 = "extremely," the degree to which each of the 20

emotions reflects how they have been feeling "in the past week." Internal consistency reliabilities have ranged from .86 to .90 for PA and from .84 to .87 for NA. Convergent correlations for both the PANAS scales range from .89 to .95, indicating strong correlations between each of the PANAS scales and their corresponding regression-based factor scores. Furthermore, the discriminant correlations for both of the PANAS scales are quite low, ranging from -.02 to -.18. Test-retest reliabilities (8-week retest interval) for both the PANAS-PA and PANAS-NA were reported as .47. This measure is also highly correlated with other measures of distress and psychopathology. For example, correlations between the PANAS-NA scale and the Hopkins Symptom Checklist are .65 to .74, while those between the PANAS-NA and the Beck Depression Inventory are .56 to .58 (Watson et al., 1988).

#### World Assumptions Scale: Self-Worth Subscale (WAS)

This subscale consists of 12 statements related to feelings of self-worth (Janoff-Bulman, 1989). It was derived from the 32-item, factor-analytically validated World Assumptions Scale. For each of the 12 items, participants are to indicate their level of agreement with the statement on a 6-point scale ranging from 1 = "strongly disagree" to 6 = "strongly agree." Reported internal consistency reliability ranges from .66 to .76 (Janoff-Bulman, 1989) and more positive self-descriptors on the WAS have been associated with improved recovery from traumatic experiences (e.g., Janoff-Bulman, 1992). No test-retest reliability data were reported.

#### Automatic Thoughts Questionnaire (ATQ)

This instrument contains 30 items which assess the prevalence of negative self-cognitions regarding personal maladjustment and desire for change, negative self-concepts and negative expectations, low self-esteem, and helplessness (Hollon &

Kendall, 1980). Participants are to indicate the degree to which each statement describes how they have been thinking about themselves "within the past week," ranging from 1 = "not at all" to 5 = "all the time." Internal consistency reliability is high, with an alpha coefficient of .97. Good discriminant validity has also been demonstrated by the successful discrimination between depressed and nondepressed individuals. Data on test-retest reliability were unavailable. Strong correlations with the Beck Depression Inventory and the MMPI Depression Scale suggest good concurrent validity (Hollon & Kendall, 1980).

### Symptom Questionnaire (SQ)

This 92-item instrument includes four subscales pertaining to psychopathology and four corresponding well-being subscales. The four dimensions assessed by these subscales are depression-contented, anxiety-relaxed, somatic-somatic well-being, and hostility-friendly (Kellner, 1987). Participants are asked to report "yes/true" or "no/false" regarding whether each symptom has been experienced "during the past week." In the current study, the SQ was reduced into one subscale representing psychological well-being (SQ-POS) and one subscale representing symptomatology (SQ-NEG). The mean of the relaxed, contented, somatic well-being, and friendly subscales yielded an overall SQ-POS score, while the mean of the anxiety, depression, somatic, and hostility subscales yielded an overall SQ-NEG score. No other studies in which the SQ was divided into SQ-POS and SQ-NEG have been found. Thus, no psychometric data for SQ-POS and SQ-NEG were available. Psychometric data for the scale as a whole were also unavailable. Based on the current sample, internal consistency for SQ-POS was .90, while that for SQ-NEG was .94.

Based on previous studies which have examined the eight subscales, internal consistency ranges from .75 to .95 for the anxiety, .74 to .93 for the depression, .57 to

.84 for the somatic, and .78 to .95 for the hostility dimensions (Kellner, 1987). The SQ and its subscales have successfully discriminated between psychiatric patients and "normals," as well as between different subgroups of psychiatric disorders, psychosomatic disorders, and physical diseases. Test-retest reliabilities (4-week retest interval) were as follows: anxiety, .71; depression, .95; somatic, .77; and hostility, .82. Although test-retest reliabilities for the well-being subscales were unavailable, they are reportedly more unstable, reflecting the sensitivity to change which is characteristic of a state measure. The SQ is also highly correlated with other measures of psychopathology and symptom distress. For example, the correlation between the SQ depression scale and the Hamilton Rating Scale for Depression is .66, while that between the SQ and the Hopkins Symptom Checklist ranges from .39 for hostility to .86 for the depression subscale (Kellner, 1987).

### Trauma Survey (TS)

This 31-item inventory consists of 30 specific traumatic events and an open-ended "other" category in which participants are asked to describe any other trauma they may have experienced which is not included on the list. Individuals are to "check" any events that involve exposure to actual or threatened death or serious injury or that threatened to shatter him/her or someone close to him/her, physically or psychologically. They are also asked to indicate at what age the event(s) occurred and to rate, on a scale from 0= "not at all" to 10= "extremely," the degree of trauma experienced. Test-retest reliability coefficients have been calculated by collapsing items into nine broader content categories (Wagner & Harter, 1998). Cohen's Kappa for agreement between Time 1 and Time 2 (two weeks later) for the occurrence or non-occurrence of the resulting nine traumatic event categories ranged from  $k=.30$  to  $.80$  (emotional abuse = .30, loss/injury due to natural disaster = .45, illness/injury to

self/friend/family = .48, death of friend/family member = .52, personal exposure to violence = .58, verbal abuse = .61, sexual abuse = .66, physical abuse = .79, absence/divorce of parents or spouse = .80), with a mean reliability estimate of  $\bar{k}=.58$ . Pearson's correlation coefficient for the correlation of the ratings of degree of trauma associated with events experienced in each category ranged from  $r=.50$  to  $.96$  for Time 1 and Time 2 ratings, with a mean reliability estimate of  $\bar{r}=.74$  (see Appendix B).

## CHAPTER III

### RESULTS

Positive and negative values of mood, self-cognitions, and psychological symptomatology were computed from the various questionnaires administered. The Positive and Negative Affect Schedule (PANAS) was divided into measures of positive affectivity (PANAS-PA) and negative affectivity (PANAS-NA). Similarly, the two measures of self-cognitions represented positive (WAS) and negative (ATQ) thoughts about oneself. Finally, reduction of the Symptom Questionnaire (SQ) yielded measures of psychological well-being (SQ-POS) and symptomatology (SQ-NEG).

#### Initial Assessment of Functioning

In order to assess the relationship between writing condition and mood, self-cognitions, and psychological functioning within the six week period following writing exercises, two repeated measures MANOVA's (profile analyses) were performed (one containing all of the positive dependent variables: PANAS-PA, WAS, SQ-POS and one containing all of the negative dependent variables: PANAS-NA, ATQ, SQ-NEG). The within-subjects factor was assessment point (pre-treatment, 2-week follow-up, and 6-week follow-up) and the between-subjects factor was experimental condition (Negative Writing, Positive Writing, Neutral Writing).

Analyses which examined the long-term effects of writing exercises on positive mood, positive self-cognitions, and well-being revealed no significant main effect of experimental condition, Wilks'  $\Lambda = .967$ ,  $F(6,286) = .815$ ,  $p = .56$ , effect size = .017, indicating that the level of the profiles did not differ between groups. Furthermore, analyses revealed no significant main effect of assessment point, Wilks'  $\Lambda = .948$ ,  $F(6,140) = 1.273$ ,  $p = .27$ , effect size = .052, indicating no difference in

positive mood, positive self-cognitions, and well-being across assessment points. Finally, no significant condition x assessment point interaction was found, Wilks'  $\Lambda = .942$ ,  $F(12,280) = .709$ ,  $p = .74$ , effect size = .03, indicating that the slopes of the profiles did not differ from parallelism across groups (see Tables 2-4; Figures 1-3).

Examination of the long-term effects of writing exercises on negative mood, negative self-cognitions, and psychological symptomatology also revealed no significant main effect of experimental condition, Wilks'  $\Lambda = .955$ ,  $F(6,286) = 1.115$ ,  $p = .35$ , effect size = .02, no significant main effect of assessment point, Wilks'  $\Lambda = .950$ ,  $F(6,140) = 1.229$ ,  $p = .30$ , effect size = .05, and no significant condition x assessment point interaction, Wilks'  $\Lambda = .957$ ,  $F(12,280) = .517$ ,  $p = .90$ , effect size = .008 (see Tables 2-4; Figures 4-6).

### Three-Month Follow-Up

In order to assess the relationship between writing condition and mood, self-cognitions, and psychological functioning three months after the writing exercises, two additional repeated measures MANOVA's were performed (one containing all of the positive dependent variables: PANAS-PA, WAS, SQ-POS and one containing all of the negative dependent variables: PANAS-NA, ATQ, SQ-NEG). Each of the two repeated measures MANOVA's included assessment point (6-week follow-up and 3-month follow-up) as the within-subjects factor and experimental condition (Negative Writing, Positive Writing, Neutral Writing) as the between-subjects factor.

Analyses which examined the prolonged effects of writing exercises on positive mood, positive self-cognitions, and well-being revealed no significant main effect of experimental condition, Wilks'  $\Lambda = .767$ ,  $F(6,58) = 1.375$ ,  $p = .24$ , effect size = .12, indicating that the level of the profiles did not differ between groups. In addition, no significant main effect of assessment point was found, Wilks'  $\Lambda = .878$ ,  $F(3,29) =$

$1.343$ ,  $p = .28$ , effect size = .12, indicating no difference in positive mood, positive self-cognitions, and well-being across assessment points. Finally, analyses produced no significant condition x assessment point interaction, Wilks'  $\Lambda = .833$ ,  $F(6,58) = .927$ ,  $p = .48$ , effect size = .09, indicating that the profile slopes across groups did not differ from parallelism (see Tables 2-4; Figures 7-9).

Analysis of the prolonged effects of writing exercises on negative mood, negative self-cognitions, and psychological symptomatology yielded no significant main effect of experimental condition, Wilks'  $\Lambda = .932$ ,  $F(6,58) = .344$ ,  $p = .91$ , effect size = .03, no significant main effect of assessment point, Wilks'  $\Lambda = .892$ ,  $F(3,29) = 1.174$ ,  $p = .34$ , effect size = .11, and no significant condition x assessment point interaction, Wilks'  $\Lambda = .847$ ,  $F(6,58) = .835$ ,  $p = .55$ , effect size = .08 (see Tables 2-4; Figures 10-12).

### Narrative Content Across Writing Sessions

In order to assess the relationship between experimental condition and narrative content across writing sessions, two repeated measures MANOVA's were performed (one containing content category dependent variables related to emotion: positive feelings, optimism and energy, anxiety or fear, anger, sadness or depression and one containing other content category dependent variables of interest: overall word count, insight-related words, causal words, first-person pronouns, and third-person pronouns). The within-subjects factor was writing session (Writing Session 1, Writing Session 2, and Writing Session 3) and the between-subjects factor was experimental condition (Negative Writing, Positive Writing, Neutral Writing). Follow-up analyses of effects for the within-subjects factor used polynomial contrasts, while those for the between-subjects factor used repeated contrasts.

## Content Categories Related to Positive and Negative Emotion

Analyses which examined the relationship between experimental condition and use of words related to positive feelings, optimism, anxiety, anger, and sadness across writing sessions yielded a significant main effect of experimental condition, Wilks'  $\Lambda = .163$ ,  $F(10,274) = 40.428$ ,  $p < .001$ , effect size = .596, indicating that the levels of the profiles differed between groups (see Table 5; Figures 13-17). In order to determine the nature of the between-subjects differences, follow-up contrasts were conducted using repeated contrasts (comparison of adjacent levels). With regard to the use of positive feeling words, parameter estimates indicated that the level of the profile for the Positive Writing condition was significantly higher than those for the Neutral Writing,  $t(94) = 12.726$ ,  $p < .001$ , and Negative Writing,  $t(94) = -7.959$ ,  $p < .001$ , conditions. The level of the profile for the Negative Writing condition was also significantly higher than that for the Neutral Writing condition,  $t(94) = -4.767$ ,  $p < .05$ . For use of words related to optimism, follow-up analyses indicated that the level of the profile for the Positive Writing condition was significantly higher than those for the Neutral Writing,  $t(94) = 4.390$ ,  $p < .001$ , and Negative Writing,  $t(94) = -3.878$ ,  $p < .001$ , conditions. The Negative Writing condition did not differ significantly from the Neutral Writing condition,  $t(94) = .512$ ,  $p > .05$ .

With regard to the use of anxiety words, the level of the profile for the Negative Writing condition was significantly higher than those for the Positive Writing,  $t(94) = 2.744$ ,  $p < .01$ , and Neutral Writing,  $t(94) = -6.356$ ,  $p < .001$ , conditions. Furthermore, use of anxiety words was significantly higher for the Positive Writing condition than for the Neutral Writing condition,  $t(94) = 3.615$ ,  $p < .001$ . Use of anger words was also significantly higher for the Negative Writing condition than for the Positive Writing,  $t(94) = 5.014$ ,  $p < .001$ , and Neutral Writing,  $t(94) = -6.639$ ,

$p < .001$ , conditions. However, use of words related to anger did not differ significantly between the Positive Writing and Neutral Writing conditions,  $t(94) = 1.625$ ,  $p > .05$ . Finally, with regard to words related to sadness, the level of the profile for the Negative Writing condition was significantly higher than those for the Positive Writing,  $t(94) = 6.692$ ,  $p < .001$ , and Neutral Writing,  $t(94) = -10.305$ ,  $p < .001$ , conditions, while that for the Positive Writing condition was significantly higher than that for the Neutral Writing condition,  $t(94) = 3.613$ ,  $p < .001$ .

Further analysis of the use of positive and negative emotion words in narratives yielded a significant main effect of writing session, Wilks'  $\Lambda = .808$ ,  $F(10,132) = 3.146$ ,  $p < .001$ , effect size = .192 (see Table 5; Figures 13-17). This indicated that, across experimental conditions, the use of words associated with positive feelings, optimism, anxiety, anger, and sadness differed over the course of writing. Follow-up analyses of the writing session main effect using polynomial contrasts indicated a linear trend in which the use of positive feeling words increased across writing sessions,  $t(141) = 2.905$ ,  $p < .01$ . Follow-up analyses further indicated a quadratic trend in which the use of words related to optimism evidenced a decline between the first and second writing sessions followed by a reverse in direction to a more pronounced incline between the second and third writing sessions,  $t(141) = 2.590$ ,  $p < .01$ . Finally, follow-up analyses indicated a quadratic trend in which the use of anger-related words evidenced an initial increase followed by a more dramatic decrease,  $t(141) = -1.962$ ,  $p < .05$ . Analysis did not indicate a significant change in the use of words related to either anxiety,  $F(2,282) = 1.366$ ,  $p = .257$ , effect size = .010, or sadness,  $F(2,282) = 1.076$ ,  $p = .342$ , effect size = .008, across writing sessions.

Analysis of the relationship between experimental condition and use of emotion words across writing sessions failed to yield a condition x writing session interaction, Wilks'  $\Lambda = .828$ ,  $F(20,264) = 1.299$ ,  $p = .179$ , effect size = .090. This suggests

that the slopes of the profiles did not differ from parallelism across groups. Thus, the between-group differences in use of words related to positive feelings, optimism, anxiety, anger, and sadness remained consistent across writing sessions (see Table 5; Figures 13-17).

### Other Content Categories of Interest

Analyses which examined the relationship between experimental condition and the total number of words written, the use of causal and insight-related words, and the use of first-person and third-person pronouns across writing sessions yielded a significant main effect of experimental condition, Wilks'  $\Lambda = .262$ ,  $F(10,274) = 26.153$ ,  $p < .001$ , effect size = .488, indicating that the levels of the profiles differed between groups (see Table 6; Figures 18-22). Although follow-up analyses using repeated contrasts indicated that the total number of words did not differ significantly across experimental conditions,  $F(2,141) = 1.259$ ,  $p = .287$ , effect size = .018, repeated contrasts revealed that the use of causal words was significantly higher for the Negative Writing,  $t(94) = -6.175$ ,  $p < .001$ , and Positive Writing,  $t(94) = 6.957$ ,  $p < .001$ , conditions than for the Neutral Writing condition. Use of causal words did not differ significantly between the Negative Writing and Positive Writing,  $t(94) = -.782$ ,  $p = .05$ , conditions. Follow-up analyses also revealed greater use of insight-related words within the Negative Writing condition when compared to the Positive Writing,  $t(94) = 2.085$ ,  $p < .05$ , and Neutral Writing,  $t(94) = -13.513$ ,  $p < .001$ , conditions. Use of insight-related words was also greater within the Positive Writing condition when compared to the Neutral Writing condition,  $t(94) = 11.430$ ,  $p < .001$ .

With regard to the use of first-person pronouns, follow-up analyses indicated that the level of the profile for the Neutral Writing condition was significantly higher than those for the Positive Writing,  $t(94) = -4.929$ ,  $p < .001$ , and Negative Writing,

$t(94) = 4.167$ ,  $p < .001$ , conditions. However, use of first-person pronouns did not differ significantly between the Positive Writing and Negative Writing conditions,  $t(94) = .762$ ,  $p > .05$ . For use of third-person pronouns, follow-up analyses indicated that the level of the profile for the Negative Writing condition was significantly higher than that for the Positive Writing,  $t(94) = 4.976$ ,  $p < .001$ , and Neutral Writing,  $t(94) = -7.157$ ,  $p < .001$ , conditions. The level of the profile for the Positive Writing condition was also significantly higher than that for the Neutral Writing condition,  $t(94) = 2.181$ ,  $p < .05$ .

Further analyses of narrative content yielded a significant main effect of writing session, Wilks'  $\Lambda = .797$ ,  $F(10,132) = 3.359$ ,  $p < .001$ , effect size = .203. This indicated that, across experimental conditions, the total use of words, the use of causal and insight-related words, and the use of first-person and third-person pronouns differed over the course of writing (see Table 6; Figures 18-22). Follow-up analyses of the writing session main effect using polynomial contrasts indicated a linear trend in which the total number of words decreased across writing sessions,  $t(141) = -1.942$ ,  $p = .05$ . Furthermore, a quadratic trend suggested an increase in use of insight-related words between the first and second writing sessions followed by a more modest decrease in use of insight-related words between the second and third writing sessions,  $t(141) = -1.957$ ,  $p = .05$ . Follow-up analyses further revealed a linear trend in which the use of first-person pronouns increased across writing sessions,  $t(141) = 2.538$ ,  $p < .05$ , as well as a linear trend in which the use of third-person pronouns decreased across writing sessions,  $t(141) = -3.905$ ,  $p < .001$ . Analyses did not indicate a significant change in the use of causal words across writing sessions,  $F(2,282) = 2.028$ ,  $p = .133$ , effect size = .014.

Content analyses further indicated a significant condition x writing session interaction, Wilks'  $\Lambda = .765$ ,  $F(20,264) = 1.884$ ,  $p = .01$ . This suggests that the

slopes of the profiles differed from parallelism across experimental conditions (see Table 6; Figures 18-22). Specifically, follow-up analyses using polynomial contrasts indicated a quadratic trend in which the use of insight-related words differed across writing sessions between the Negative Writing and Neutral Writing conditions,  $t(94) = 2.03$ ,  $p < .05$ , as well as between the Positive Writing and Neutral Writing conditions,  $t(94) = -2.09$ ,  $p < .05$ . Follow-up analyses also indicated a linear trend in which the use of third-person pronouns differed across writing sessions between the Negative Writing and Positive Writing conditions,  $t(94) = -3.270$ ,  $p < .01$ . Analyses did not indicate a significant difference between groups in the total number of words,  $F(4,282) = .631$ ,  $p = .641$ , effect size = .009, the use of causal words,  $F(4,282) = 1.170$ ,  $p = .324$ , effect size = .016, or the use of first-person pronouns,  $F(4,282) = 1.062$ ,  $p = .376$ , effect size = .015, across writing sessions.

This condition x writing session interaction was further assessed using paired  $t$ -tests which compared the use of insight-related words and third-person pronouns in the first writing session with that of the second writing session as well as the use of insight-related words and third-person pronouns in the second writing session with that of the third writing session within each experimental condition. Results of these analyses indicated an increase in the use of insight-related words between the first and second writing sessions for both the Negative Writing,  $t(47) = -2.799$ ,  $p < .01$ , and Positive Writing,  $t(48) = -2.114$ ,  $p < .04$ , conditions. For the Neutral Writing condition, a decrease was found in the use of insight-related words between the first and second writing sessions,  $t(47) = 2.338$ ,  $p < .05$ . There were no significant differences in the use of insight-related words between the second and third writing sessions for the Negative Writing,  $t(47) = .451$ ,  $p = .654$ , Positive Writing,  $t(47) = 1.077$ ,  $p = .287$ , or Neutral Writing,  $t(48) = -.539$ ,  $p = .593$ , conditions.

With regard to the use of third-person pronouns, analyses indicated a decrease between the second and third writing sessions for the Negative Writing condition,  $t(47) = 2.295$ ,  $p < .05$ . There were no significant differences in the use of third-person pronouns between the first and second writing sessions for the Negative Writing,  $t(47) = 1.142$ ,  $p = .165$ , Positive Writing,  $t(48) = .780$ ,  $p = .439$ , or Neutral Writing,  $t(47) = 1.357$ ,  $p = .181$ , conditions, nor were there any significant differences in the use of third-person pronouns between the second and third writing sessions for the Positive Writing,  $t(47) = 1.168$ ,  $p = .249$ , or Neutral Writing,  $t(48) = .435$ ,  $p = .666$ , conditions.

#### Narrative Content Related to Long-term Improvement

In an effort to examine the narrative features which are associated with improved mood, self-cognitions, and psychological symptomatology six weeks after writing exercises, individuals were placed into groups based on overall level of long-term improvement (those who improved the most versus those who improved to a lesser extent or not at all). Specifically, for all participants, "change" scores were obtained by calculating the difference between pre-treatment and six-week follow-up scores for each outcome measure (PANPA, PANNA, WAS, ATQ, SQ-POS, SQ-NEG). Each of these "change" scores was then converted to a z-score. The mean of these z-scores was then computed in order to derive a composite outcome measure for each participant. This composite outcome measure was then used to select the top and bottom third of participants, namely those who tended to improve across outcome measures and those who showed the least amount of improvement (see Pennebaker, 1993). Those in the most improved group showed improvement on 83% of the outcome variables, while those in the least improved group showed improvement on 17% of the variables (representing deterioration in overall outcome). Results of a one-

way ANOVA indicated that the defined groups ("more improved" and "deteriorated") were statistically different,  $F(1, 97) = 258.19$ ,  $p < .001$ .

In order to assess the relationship between experimental condition, improvement status, and narrative content across writing sessions, two repeated measures MANOVA's were performed (one containing content category dependent variables related to emotion: positive feelings, optimism and energy, anxiety or fear, anger, sadness or depression and one containing other content category dependent variables of interest: overall word count, insight-related words, causal words, first-person pronouns, and third-person pronouns). The within-subjects factor was writing session (Writing Session 1, Writing Session 2, and Writing Session 3), while the between-subjects factors were experimental condition (Negative Writing, Positive Writing, Neutral Writing) and improvement status (More Improved and Less Improved). Follow-up analyses of effects for the within-subjects factor used polynomial contrasts, while those for the between-subjects factors used repeated contrasts.

#### Content Categories Related to Positive and Negative Emotion

Analyses which examined the relationship between experimental condition, improvement status, and use of words related to positive feelings, optimism, anxiety, anger, and sadness across writing sessions yielded no significant main effect of improvement status, Wilks'  $\Lambda = .987$ ,  $F(5, 86) = .226$ ,  $p = .95$ , effect size = .013, indicating that the level of the profiles did not differ between improvement status groups. Analyses further revealed no significant condition x improvement status interaction, Wilks'  $\Lambda = .932$ ,  $F(10, 172) = .614$ ,  $p = .801$ , effect size = .034, no significant improvement status x writing session interaction, Wilks'  $\Lambda = .882$ ,  $F(10, 81) = 1.083$ ,  $p = .385$ , effect size = .118, and no significant condition x improvement status x writing session interaction, Wilks'  $\Lambda = .760$ ,  $F(20, 162) =$

1.193,  $p = .266$ , effect size = .128. Thus, the use of words related to positive feelings, optimism, anxiety, anger, and sadness did not differ based on improvement status, whether overall, between experimental groups, or across writing sessions (see Table 5; Figures 23-37).

In order to examine whether those who improved most within the Negative Writing condition used a moderate number of negative emotion words, analyses included tests of the curvilinear relationship between negative emotion word use and the various outcome measures (see Pennebaker et al., 1997). A curvilinear negative emotion word use variable was computed by using the absolute value of the standardized negative emotion LIWC variable. Analyses yielded no significant relationship between the curvilinear negative emotion word use variable and long-term positive mood ( $r = .30$ ,  $p = .72$ ), negative mood ( $r = .42$ ,  $p = .43$ ), positive self-cognitions ( $r = .31$ ,  $p = .70$ ), negative self-cognitions ( $r = .47$ ,  $p = .31$ ), psychological symptomatology ( $r = .49$ ,  $p = .27$ ), and well-being ( $r = .34$ ,  $p = .62$ ). Thus, those who used a moderate number of negative emotion words did not benefit more than did those who had either very high or very low negative emotion word usage.

### Other Content Categories of Interest

Analyses which examined the relationship between experimental condition, improvement status, and the total number of words written, the use of causal and insight-related words, and the use of first-person and third-person pronouns across writing sessions also revealed no significant main effect of improvement status, Wilks'  $\Lambda = .951$ ,  $F(5, 86) = .880$ ,  $p = .498$ , effect size = .049, no significant condition x improvement status interaction, Wilks'  $\Lambda = .938$ ,  $F(10, 172) = .561$ ,  $p = .84$ , effect size = .032, no significant improvement status x writing session interaction, Wilks'  $\Lambda$

= .929,  $F(10, 81) = .621$ ,  $p = .792$ , effect size = .071, and no significant condition x improvement status x writing session interaction, Wilks'  $\Lambda = .830$ ,  $F(20, 162) = .790$ ,  $p = .723$ , effect size = .089. Thus, the total number of words, the use of causal and insight-related words, and the use of first-person and third-person pronouns did not differ based on improvement status, whether overall, between experimental groups, or across writing sessions (see Table 6; Figures 38-52).

Table 1: Frequency of Occurrence and Mean Rating of Trauma Categories for Participants in the Current Study

Trauma Category	Frequency Reported <sup>b</sup>	Mean Rating <sup>b</sup>	Frequency Reported <sup>c</sup>	Mean Rating <sup>c</sup>
Death of friend/family member <sup>a</sup>	67%	7.86	60%	8.20
Illness/injury of self/friend/family <sup>a</sup>	59%	6.72	39%	8.05
Absence/divorce of parents or spouse <sup>a</sup>	28%	6.90	19%	8.46
Verbal abuse	28%	6.34	16%	8.21
Personal exposure to violence <sup>a</sup>	18%	5.68	6%	8.11
Emotional abuse	15%	7.36	11%	8.24
Loss/injury due to natural disaster <sup>a</sup>	11%	5.35	5%	7.86
Physical abuse	8%	6.25	5%	8.57
Sexual abuse	5%	8.75	5%	9.29

<sup>a</sup> Combines reports of several relevant events from the Trauma Survey

<sup>b</sup> Includes all participants in the current study

<sup>c</sup> Includes only those in the current study who rated the traumatic event (or an item included in the trauma category) as severe (7-10 on a Likert scale)

**Table 2:** Mean Levels of Positive and Negative Mood for Each Experimental Condition Across Assessment Points  
 (Standard deviations represented within parentheses)

Measures	Session			
	Pre-Writing Session 1	2-week	Follow-up 6-week	3-month
<b>PANPA</b> (positive scale)				
Negative Condition	32.52 (6.79)	33.20 (7.65)	34.76 (10.68)	32.31 (6.10)
Positive Condition	32.45 (6.15)	33.18 (6.62)	32.96 (7.17)	33.90 (6.69)
Neutral Condition	34.10 (6.61)	35.41 (6.44)	36.04 (10.29)	32.00 (5.66)
<b>PANNA</b> (negative scale)				
Negative Condition	22.96 (7.75)	22.40 (8.47)	22.10 (11.80)	20.69 (5.88)
Positive Condition	23.75 (7.76)	23.67 (7.26)	23.08 (6.76)	19.50 (8.36)
Neutral Condition	22.96 (5.91)	23.76 (7.96)	24.49 (12.15)	19.73 (4.50)

Note: Scores for PANPA and PANNA range from 10 to 50

**Table 3:** Mean Levels of Positive and Negative Self-Cognitions for Each Experimental Condition Across Assessment Points  
 (Standard deviations represented within parentheses)

Measures	Session			Follow-up 6-week 3-month
	Pre-Writing Session 1	2-week	3-month	
<b>WAS (positive scale)</b>				
Negative Condition	4.07 (.88)	4.27 (1.02)	4.28 (1.06)	3.90 (.64)
Positive Condition	4.20 (.92)	4.34 (.77)	4.23 (.80)	4.42 (.86)
Neutral Condition	4.35 (.54)	4.33 (.60)	4.44 (.91)	4.35 (.81)
<b>ATQ (negative scale)</b>				
Negative Condition	54.84 (24.09)	52.06 (22.91)	53.24 (36.03)	49.54 (14.68)
Positive Condition	50.86 (17.43)	48.51 (16.89)	50.20 (19.71)	43.40 (12.76)
Neutral Condition	49.55 (13.14)	50.45 (18.23)	54.27 (35.65)	43.18 (10.62)

Note: Scores for WAS range from 1 to 6  
 Scores for ATQ range from 30 to 150

**Table 4:** Mean Levels of Positive and Negative Psychological Symptoms for Each Experimental Condition Across Assessment Points (Standard deviations represented within parentheses)

Measures	Session			
	Pre-Writing Session 1	2-week	Follow-up 6-week	3-month
<b>SQPOS</b>				
Negative Condition	7.66 (1.41)	7.70 (1.81)	8.37 (6.76)	7.76 (1.26)
Positive Condition	7.84 (1.55)	7.47 (1.34)	7.71 (1.55)	6.80 (.63)
Neutral Condition	7.32 (.95)	7.09 (1.04)	8.20 (6.76)	7.02 (.61)
<b>SQNEG</b>				
Negative Condition	28.01 (3.67)	28.51 (4.56)	31.06 (18.12)	27.52 (4.97)
Positive Condition	27.39 (3.69)	28.04 (3.67)	27.84 (3.90)	29.78 (3.15)
Neutral Condition	27.91 (2.94)	27.88 (3.78)	30.82 (18.26)	28.62 (2.37)

Note: Scores for SQPOS range from 0 to 24  
 Scores for SQNEG range from 0 to 68

**Table 5:** Mean Percentage of Emotion Words Used by Each Experimental Condition Across Writing Sessions (Standard deviations represented within parentheses)

Content Categories	Writing Session		
	Session 1	Session 2	Session 3
<b><u>Positive Feelings</u></b>			
Negative Condition (overall)	0.58 (0.51)	0.64 (0.57)	0.88 (0.92)
Most Improved	0.54 (0.45)	0.76 (0.65)	1.06 (0.81)
Least Improved	0.83 (0.57)	0.62 (0.59)	1.00 (1.19)
Positive Condition (overall)	1.48 (0.98)	1.57 (1.00)	1.96 (1.51)
Most Improved	1.68 (1.10)	1.56 (1.15)	2.35 (2.29)
Least Improved	1.48 (1.06)	1.46 (0.95)	1.90 (1.08)
Neutral Condition (overall)	0.16 (0.27)	0.08 (0.20)	0.11 (0.23)
Most Improved	0.16 (0.19)	0.14 (0.28)	0.04 (0.13)
Least Improved	0.19 (0.29)	0.08 (0.20)	0.22 (0.31)
<b><u>Optimism</u></b>			
Negative Condition (overall)	0.38 (0.35)	0.34 (0.33)	0.53 (0.57)
Most Improved	0.56 (0.35)	0.37 (0.35)	0.25 (0.25)
Least Improved	0.28 (0.34)	0.34 (0.38)	0.47 (0.43)
Positive Condition (overall)	0.74 (0.67)	0.60 (0.58)	0.80 (0.71)
Most Improved	0.60 (0.36)	0.59 (0.67)	0.79 (0.83)
Least Improved	0.64 (0.55)	0.52 (0.60)	0.83 (0.62)
Neutral Condition (overall)	0.45 (0.59)	0.36 (0.40)	0.33 (0.33)
Most Improved	0.62 (0.84)	0.25 (0.25)	0.28 (0.28)
Least Improved	0.24 (0.37)	0.47 (0.43)	0.29 (0.31)

**Table 5 (continued)**

Content Categories	Writing Session		
	Session 1	Session 2	Session 3
<b>Anxiety</b>			
<b>Negative Condition (overall)</b>	0.45 (0.48)	0.60 (0.54)	0.61 (0.61)
Most Improved	0.44 (0.55)	0.69 (0.53)	0.61 (0.53)
Least Improved	0.54 (0.46)	0.61 (0.59)	0.77 (0.83)
<b>Positive Condition (overall)</b>	0.37 (0.45)	0.42 (0.55)	0.35 (0.51)
Most Improved	0.48 (0.50)	0.49 (0.59)	0.42 (0.59)
Least Improved	0.36 (0.51)	0.42 (0.41)	0.27 (0.49)
<b>Neutral Condition (overall)</b>	0.12 (0.27)	0.15 (0.24)	0.17 (0.27)
Most Improved	0.11 (0.19)	0.15 (0.16)	0.28 (0.36)
Least Improved	0.09 (0.21)	0.18 (0.31)	0.08 (0.21)
<b>Anger</b>			
<b>Negative Condition (overall)</b>	0.55 (0.46)	0.77 (0.96)	0.53 (0.54)
Most Improved	0.63 (0.43)	0.49 (0.50)	0.54 (0.39)
Least Improved	0.41 (0.43)	1.14 (1.44)	0.53 (0.68)
<b>Positive Condition (overall)</b>	0.27 (0.32)	0.32 (0.43)	0.21 (0.34)
Most Improved	0.27 (0.29)	0.31 (0.33)	0.18 (0.26)
Least Improved	0.24 (0.36)	0.32 (0.42)	0.21 (0.37)
<b>Neutral Condition (overall)</b>	0.17 (0.35)	0.12 (0.21)	0.15 (0.27)
Most Improved	0.21 (0.42)	0.12 (0.23)	0.29 (0.39)
Least Improved	0.13 (0.22)	0.14 (0.20)	0.07 (0.16)
<b>Sadness</b>			
<b>Negative Condition (overall)</b>	0.86 (0.71)	0.80 (0.63)	0.93 (0.72)
Most Improved	0.77 (0.77)	0.76 (0.62)	0.79 (0.61)
Least Improved	0.89 (0.61)	0.84 (0.68)	0.96 (0.84)
<b>Positive Condition (overall)</b>	0.45 (0.51)	0.36 (0.45)	0.32 (0.44)
Most Improved	0.65 (0.62)	0.20 (0.26)	0.38 (0.52)
Least Improved	0.40 (0.45)	0.31 (0.34)	0.28 (0.49)
<b>Neutral Condition (overall)</b>	0.12 (0.24)	0.07 (0.17)	0.15 (0.27)
Most Improved	0.14 (0.29)	0.10 (0.18)	0.19 (0.31)
Least Improved	0.09 (0.23)	0.08 (0.21)	0.12 (0.22)

**Table 6: Mean Percentage of Words in Other Content Categories of Interest Used by Each Experimental Condition Across Writing Sessions (Standard deviations represented within parentheses)**

Content Categories	Writing Session		
	Session 1	Session 2	Session 3
<b><u>Word Count (total words per essay)</u></b>			
Negative Condition (overall)	301.35 (71.92)	299.25 (72.70)	279.67 (80.52)
Most Improved	295.00 (88.01)	294.83 (67.90)	289.72 (80.72)
Least Improved	297.07 (59.08)	288.00 (67.64)	274.00 (88.76)
Positive Condition (overall)	281.00 (88.61)	281.94 (81.75)	268.71 (86.89)
Most Improved	291.86 (56.67)	280.93 (72.13)	277.29 (81.26)
Least Improved	261.16 (87.61)	269.53 (83.42)	239.63 (81.40)
Neutral Condition (overall)	96.19 (66.75)	281.94 (81.75)	295.75 (76.53)
Most Improved	298.79 (78.61)	310.21 (53.00)	312.07 (40.72)
Least Improved	282.53 (63.74)	297.82 (79.15)	279.53 (92.27)
<b><u>First-Person Pronouns</u></b>			
Negative Condition (overall)	11.28 (3.15)	12.05 (2.72)	11.58 (2.90)
Most Improved	11.03 (4.15)	11.95 (2.86)	11.74 (3.32)
Least Improved	11.92 (3.05)	11.92 (3.11)	10.99 (2.79)
Positive Condition (overall)	11.09 (2.42)	11.50 (2.25)	11.41 (2.81)
Most Improved	11.19 (2.25)	11.32 (2.89)	11.23 (3.60)
Least Improved	11.74 (2.14)	11.38 (2.21)	12.29 (2.29)
Neutral Condition (overall)	12.83 (1.46)	13.26 (2.08)	13.79 (1.68)
Most Improved	13.04 (1.29)	12.86 (2.10)	12.94 (1.37)
Least Improved	13.14 (1.12)	13.06 (1.70)	13.96 (1.80)

**Table 6 (continued)**

Content Categories	Writing Session		
	Session 1	Session 2	Session 3
<b><u>Third-Person Pronouns</u></b>			
Negative Condition (overall)	4.87 (2.73)	4.40 (2.48)	3.66 (2.56)
Most Improved	5.50 (3.03)	4.49 (2.66)	4.76 (2.98)
Least Improved	4.18 (2.63)	3.66 (2.72)	3.00 (2.22)
Positive Condition (overall)	2.36 (2.21)	2.66 (2.39)	2.36 (1.99)
Most Improved	1.99 (2.35)	2.26 (2.58)	2.17 (2.05)
Least Improved	2.96 (2.38)	2.61 (2.13)	2.57 (1.95)
Neutral Condition (overall)	1.95 (1.35)	1.60 (1.67)	1.40 (1.40)
Most Improved	2.56 (1.37)	1.24 (0.92)	1.44 (1.08)
Least Improved	1.64 (1.20)	1.85 (1.89)	1.27 (1.12)
<b><u>Causal Words</u></b>			
Negative Condition (overall)	0.96 (0.62)	1.23 (0.86)	1.14 (0.80)
Most Improved	0.98 (0.71)	1.37 (1.13)	1.08 (0.78)
Least Improved	0.91 (0.68)	1.15 (0.56)	1.20 (0.88)
Positive Condition (overall)	1.05 (0.63)	1.19 (0.98)	1.32 (0.82)
Most Improved	1.04 (0.68)	1.09 (0.66)	1.19 (0.92)
Least Improved	1.07 (0.65)	1.22 (0.89)	1.29 (0.71)
Neutral Condition (overall)	0.54 (0.52)	0.54 (0.55)	0.47 (0.46)
Most Improved	0.52 (0.56)	0.73 (0.79)	0.46 (0.54)
Least Improved	0.57 (0.52)	0.47 (0.35)	0.48 (0.41)
<b><u>Insight Words</u></b>			
Negative Condition (overall)	2.41 (0.96)	3.04 (1.39)	2.93 (1.22)
Most Improved	2.54 (1.19)	3.09 (1.20)	3.07 (1.35)
Least Improved	2.30 (0.77)	3.11 (1.30)	2.57 (0.96)
Positive Condition (overall)	2.22 (1.37)	2.74 (1.36)	2.49 (1.27)
Most Improved	2.68 (1.15)	3.03 (1.42)	2.43 (1.27)
Least Improved	2.66 (1.40)	2.76 (1.32)	2.89 (1.38)
Neutral Condition (overall)	0.91 (0.55)	0.66 (0.57)	0.71 (0.58)
Most Improved	0.87 (0.54)	0.89 (0.60)	0.74 (0.69)
Least Improved	0.78 (0.40)	0.57 (0.51)	0.67 (0.59)

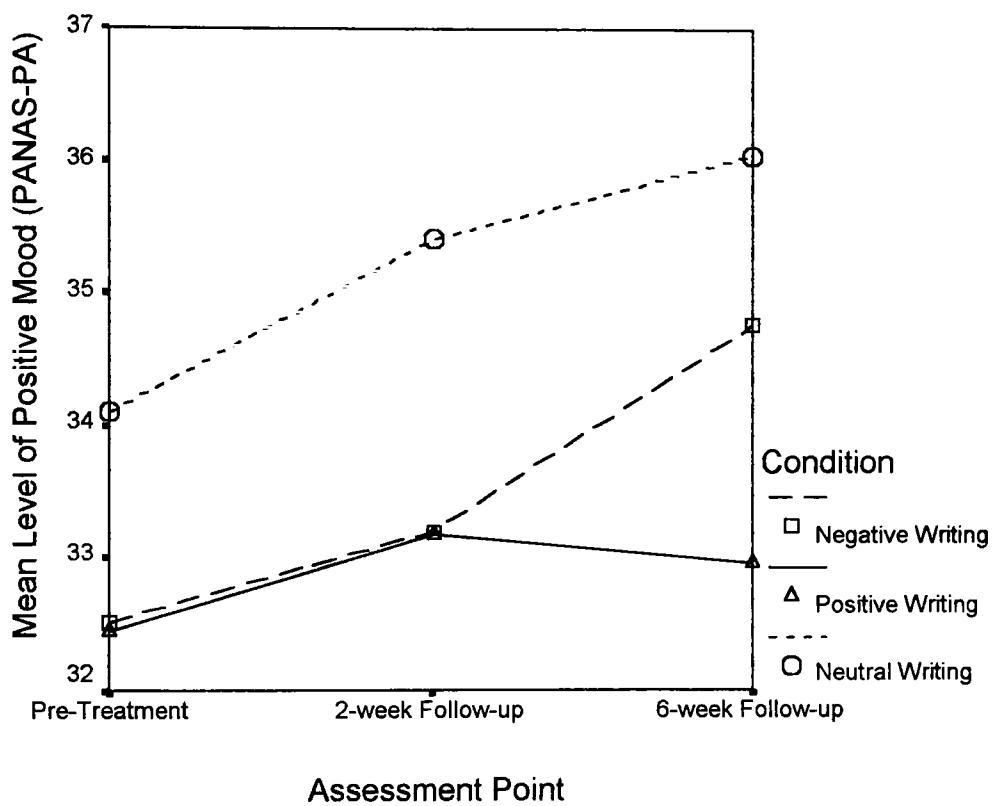
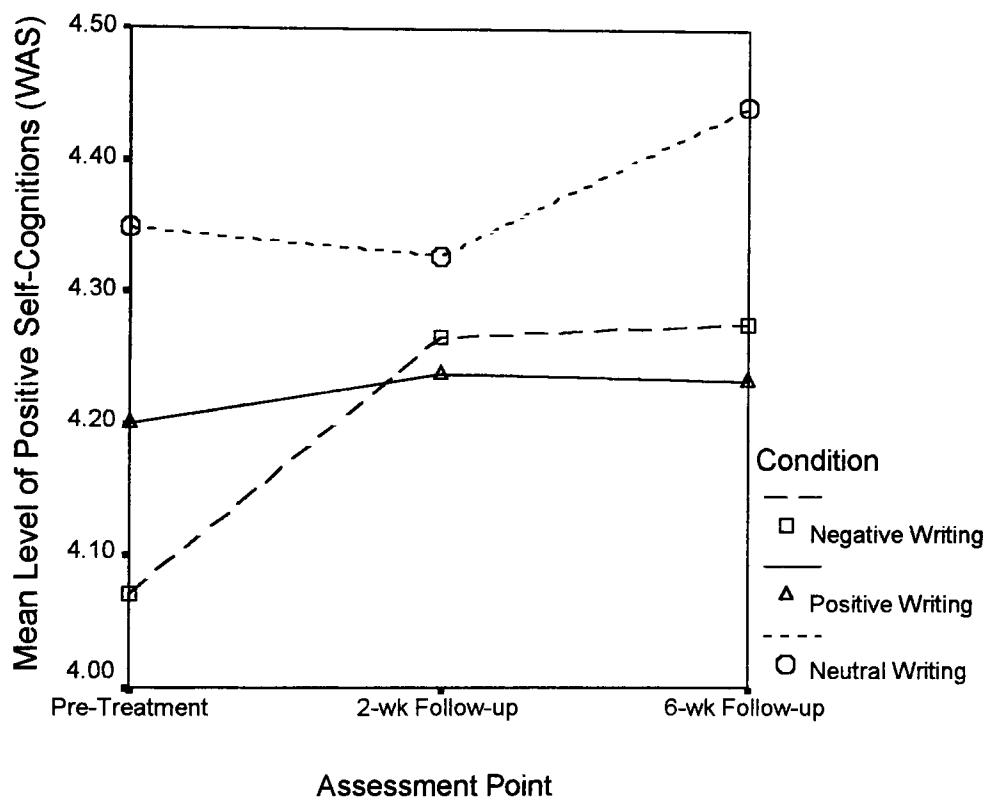


Figure 1. Mean level of positive mood (as measured by the PANAS) as a function of assessment point (up to six weeks post-writing) and experimental condition.



**Figure 2.** Mean level of positive self-cognitions (as measured by the WAS) as a function of assessment point (up to six weeks post-writing) and experimental condition.

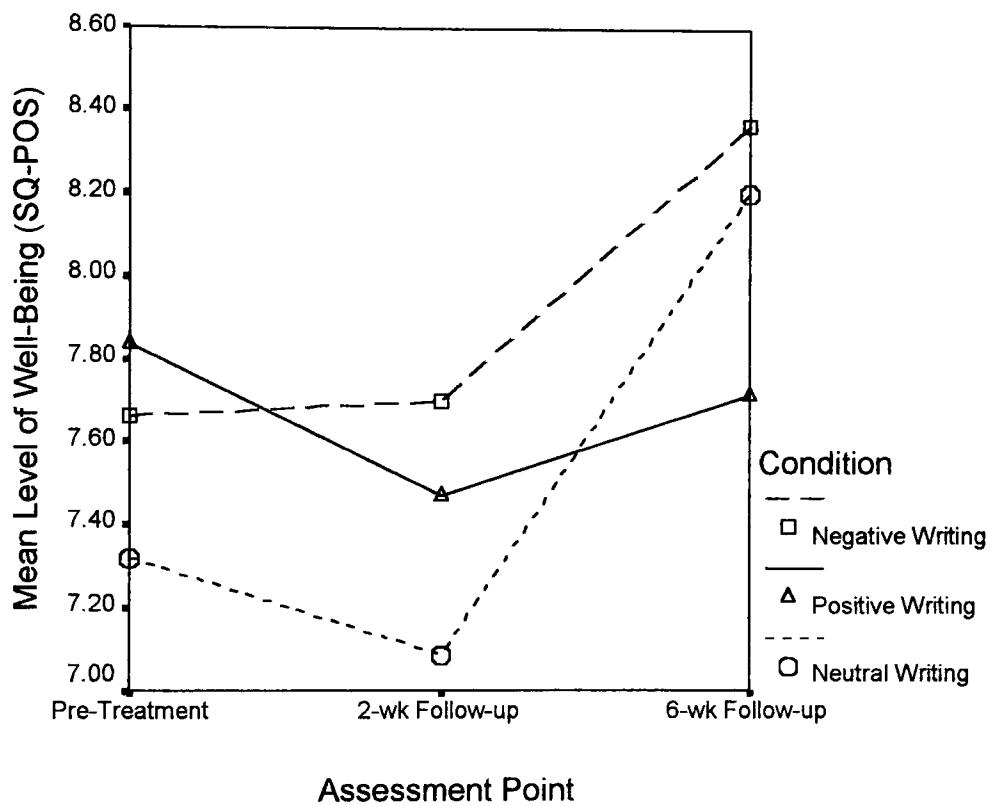
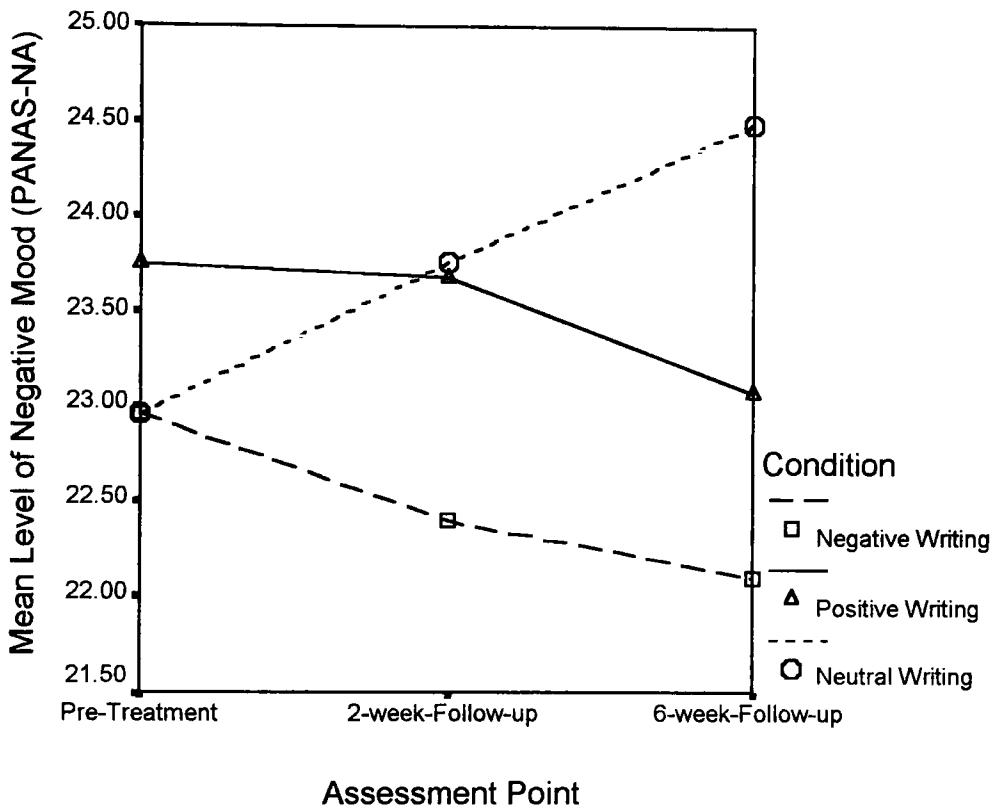
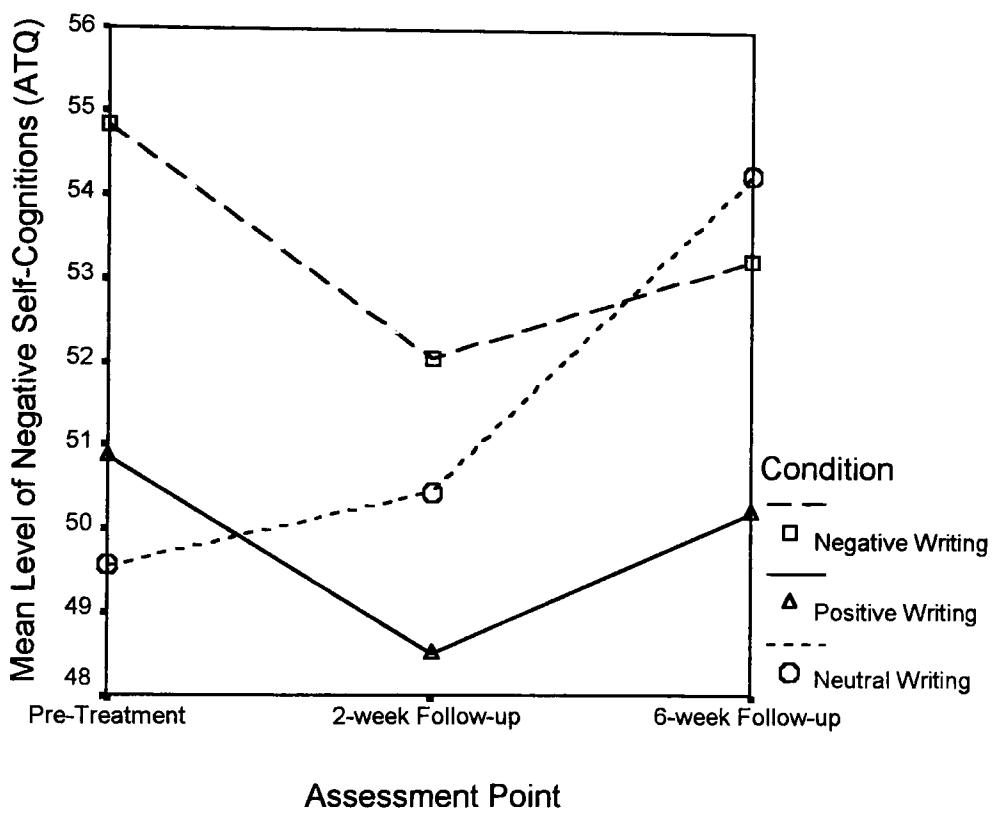


Figure 3. Mean level of well-being (as measured by the SQ) as a function of assessment point (up to six weeks post-writing) and experimental condition.



**Figure 4.** Mean level of negative mood (as measured by the PANAS) as a function of assessment point (up to six weeks post-writing) and experimental condition.



**Figure 5.** Mean level of negative self-cognitions (as measured by the ATQ) as a function of assessment point (up to six weeks post-writing) and experimental condition.

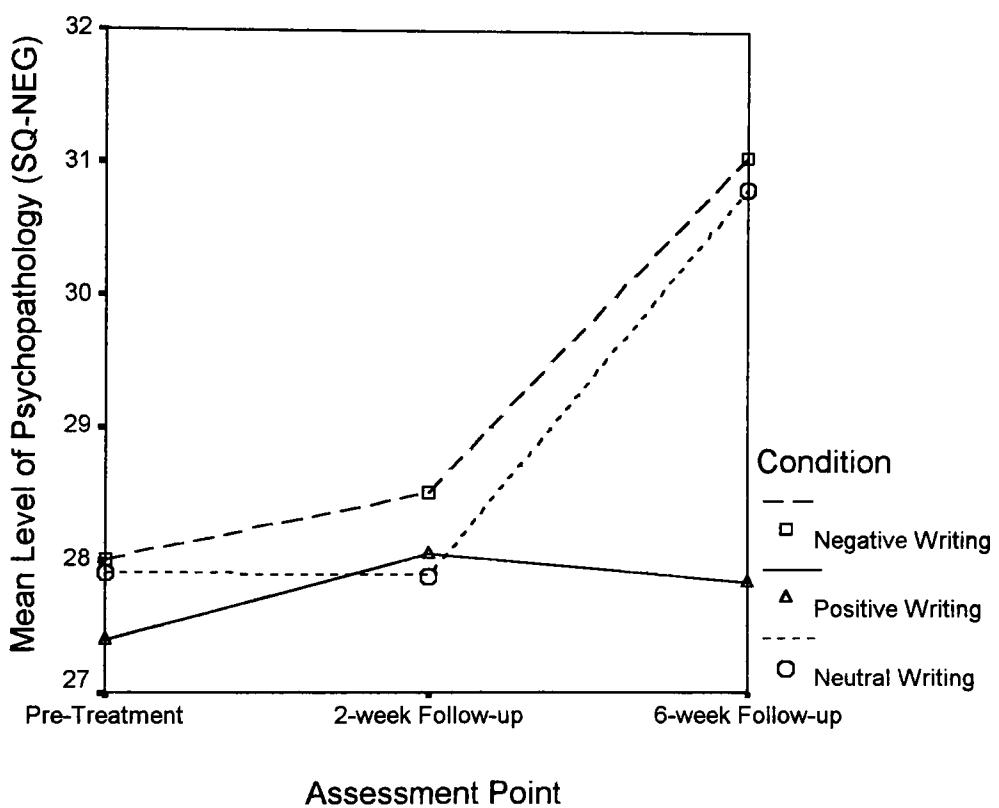


Figure 6. Mean level of psychological symptomatology (as measured by the SQ) as a function of assessment point (up to six weeks post-writing) and experimental condition.

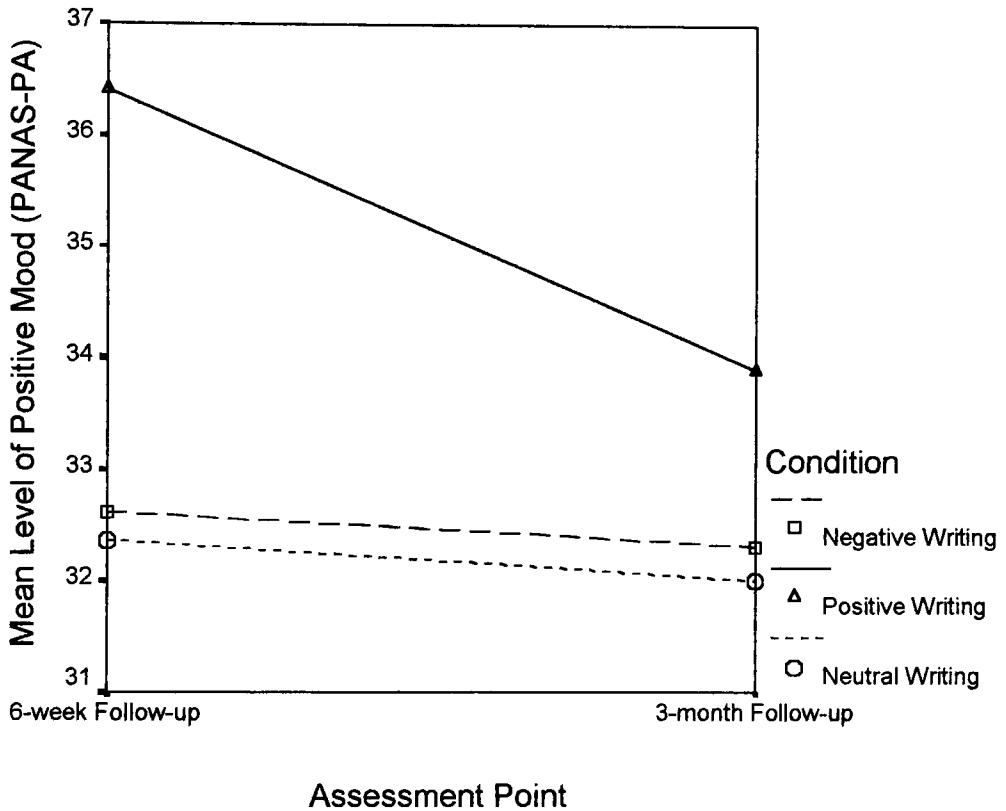


Figure 7. Mean level of positive mood (as measured by the PANAS) as a function of assessment point (up to three months post-writing) and experimental condition.

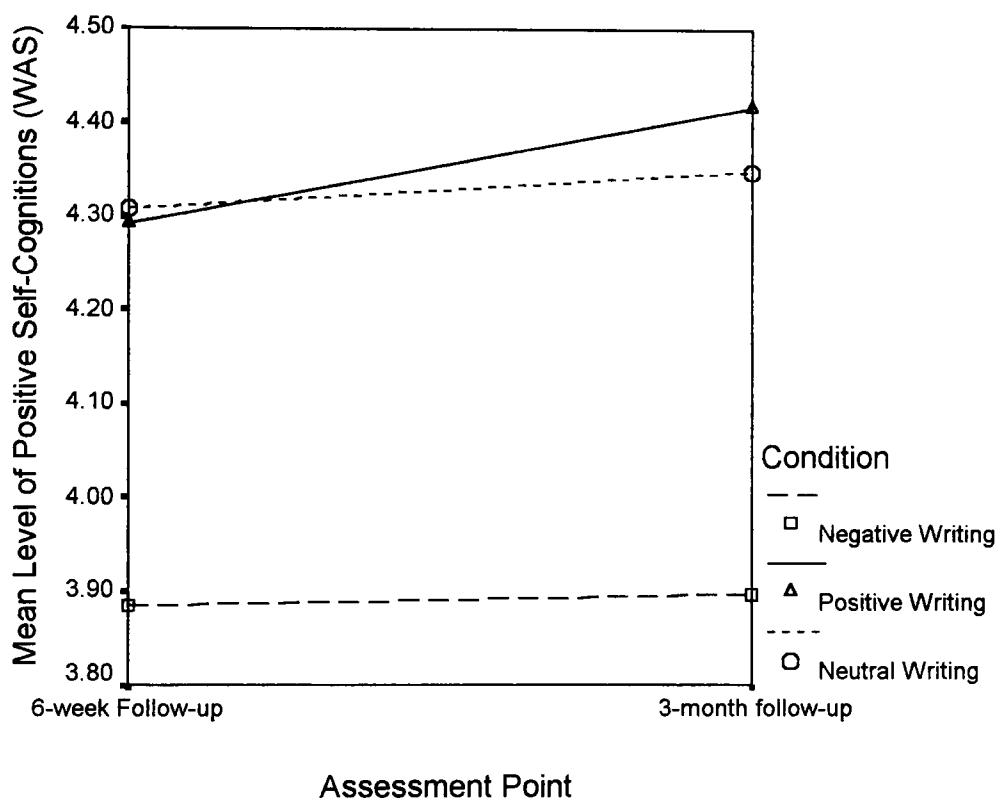


Figure 8. Mean level of positive self-cognitions (as measured by the WAS) as a function of assessment point (up to three months post-writing) and experimental condition.

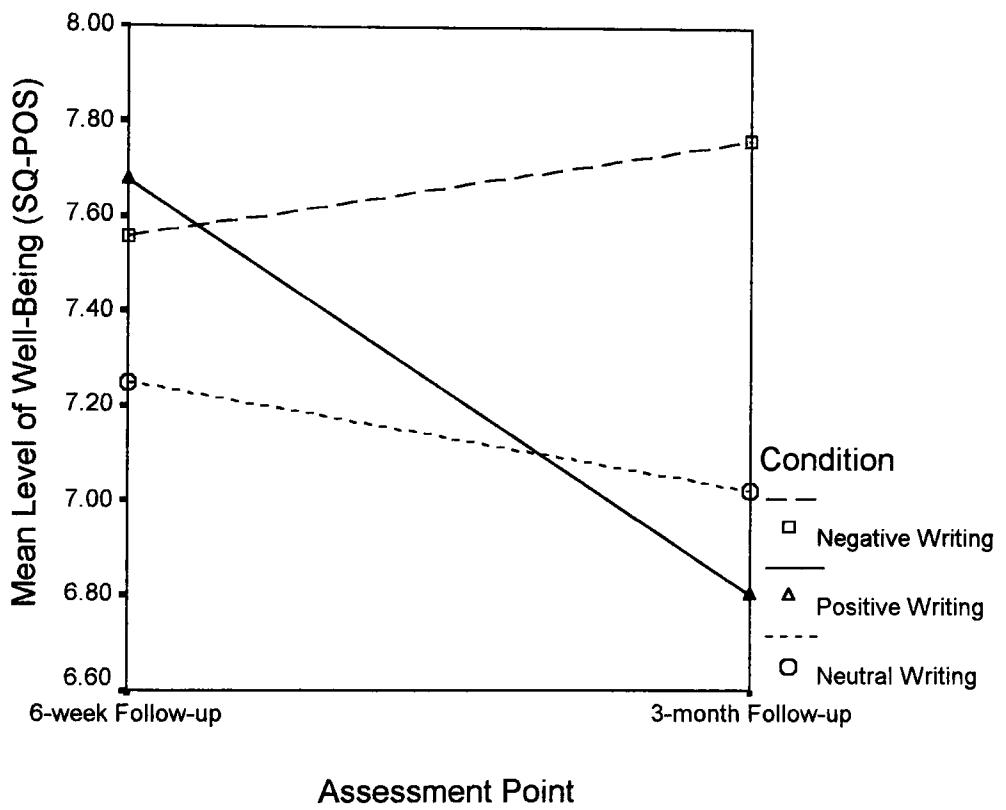
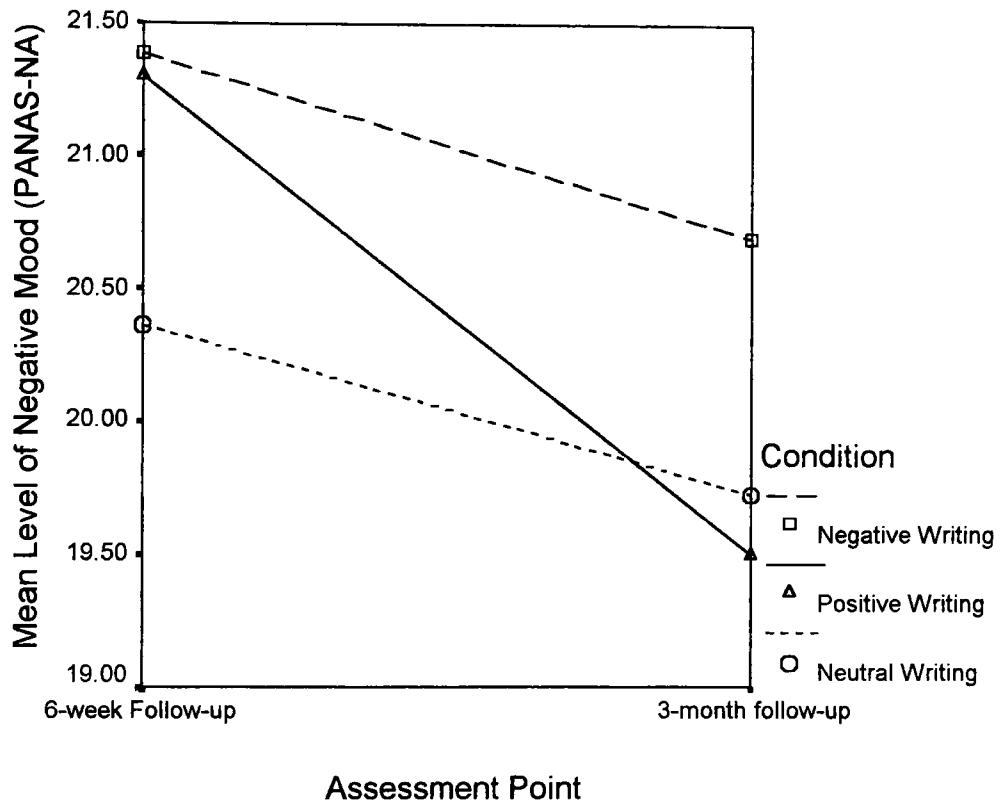


Figure 9. Mean level of well-being (as measured by the SQ) as a function of assessment point (up to three months post-writing) and experimental condition.



**Figure 10.** Mean level of negative mood (as measured by the PANAS) as a function of assessment point (up to three months post-writing) and experimental condition.

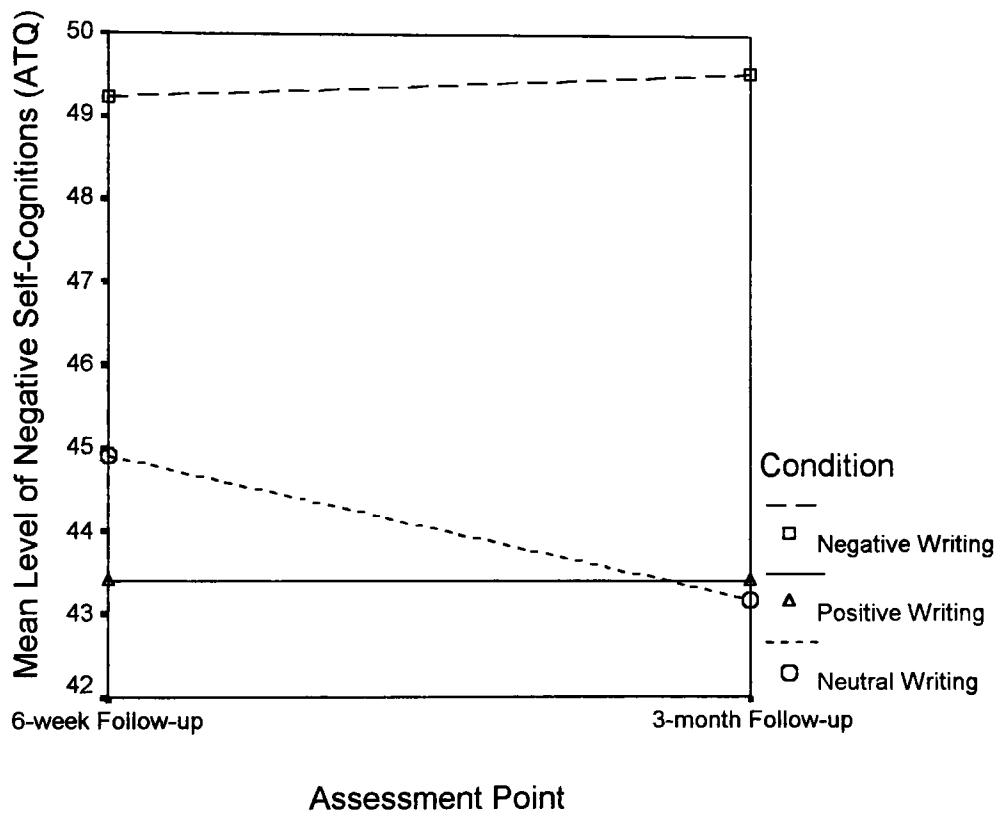
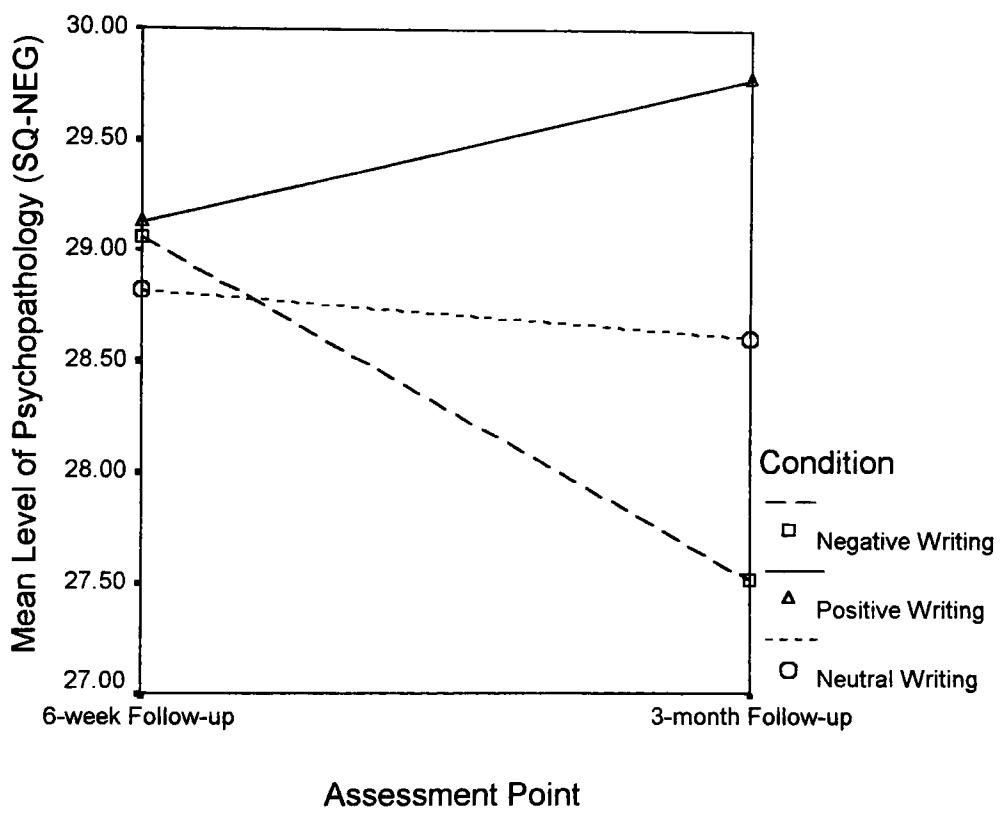


Figure 11. Mean level of negative self-cognitions (as measured by the ATQ) as a function of assessment point (up to three months post-writing) and experimental condition.



**Figure 12.** Mean level of psychological symptomatology (as measured by the SQ) as a function of assessment point (up to three months post-writing) and experimental condition.

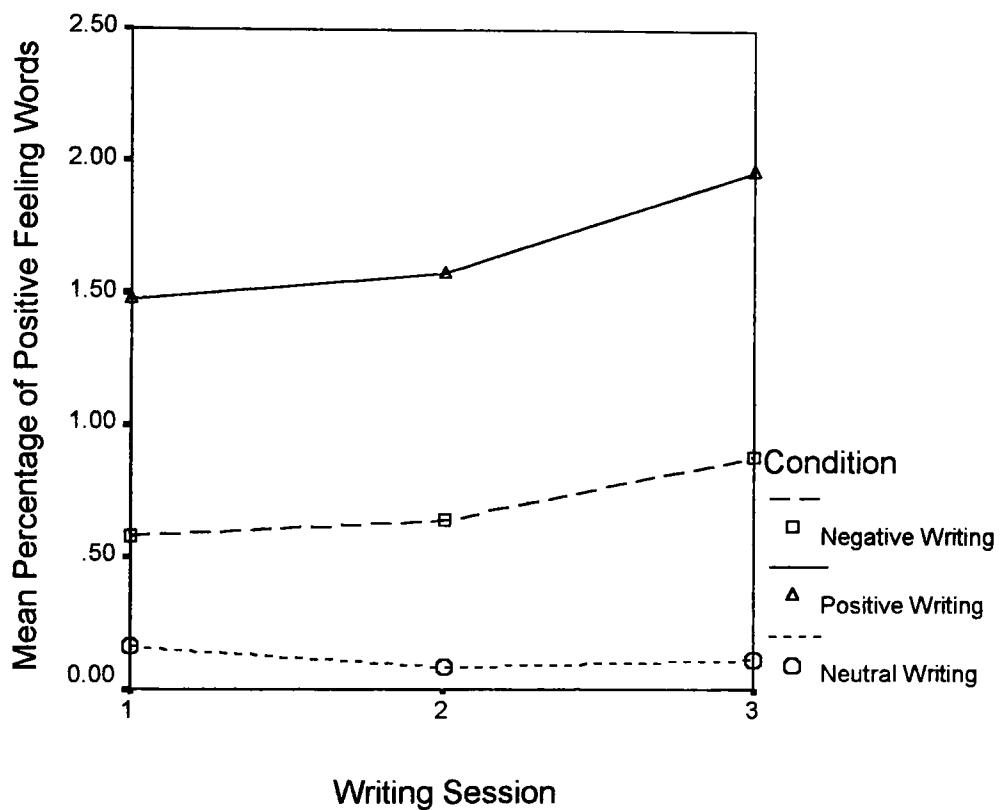


Figure 13. Mean percentage of positive feeling words used as a function of writing session and experimental condition.

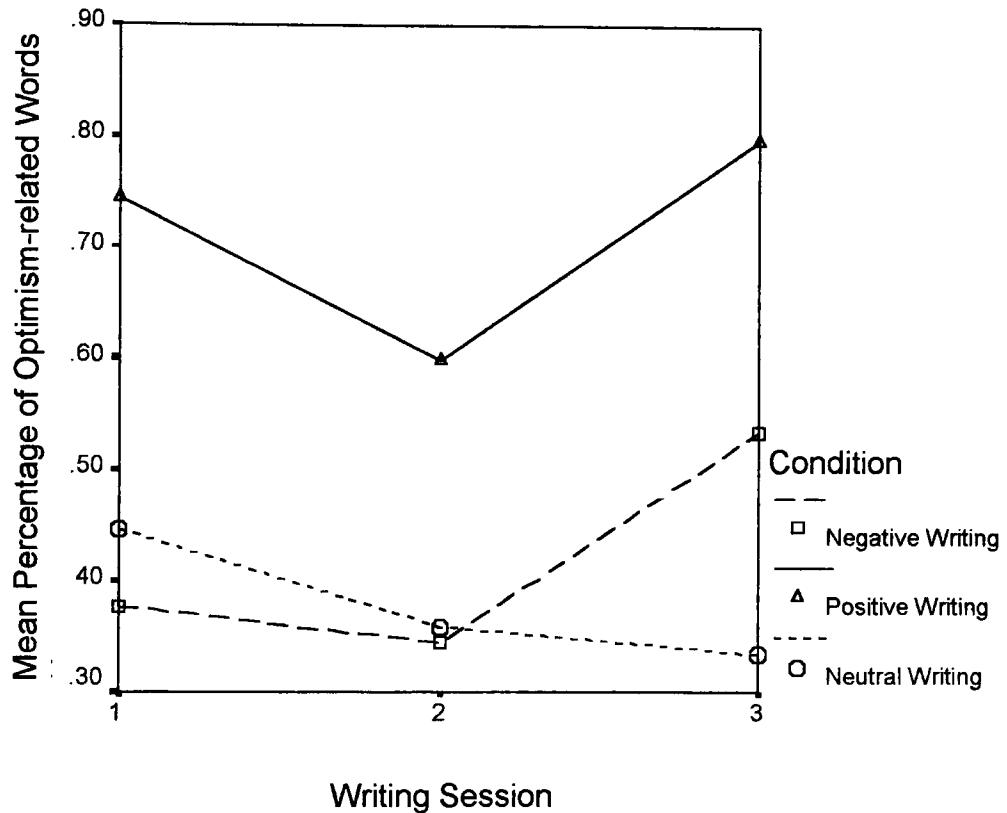


Figure 14. Mean percentage of optimism-related words used as a function of writing session and experimental condition.

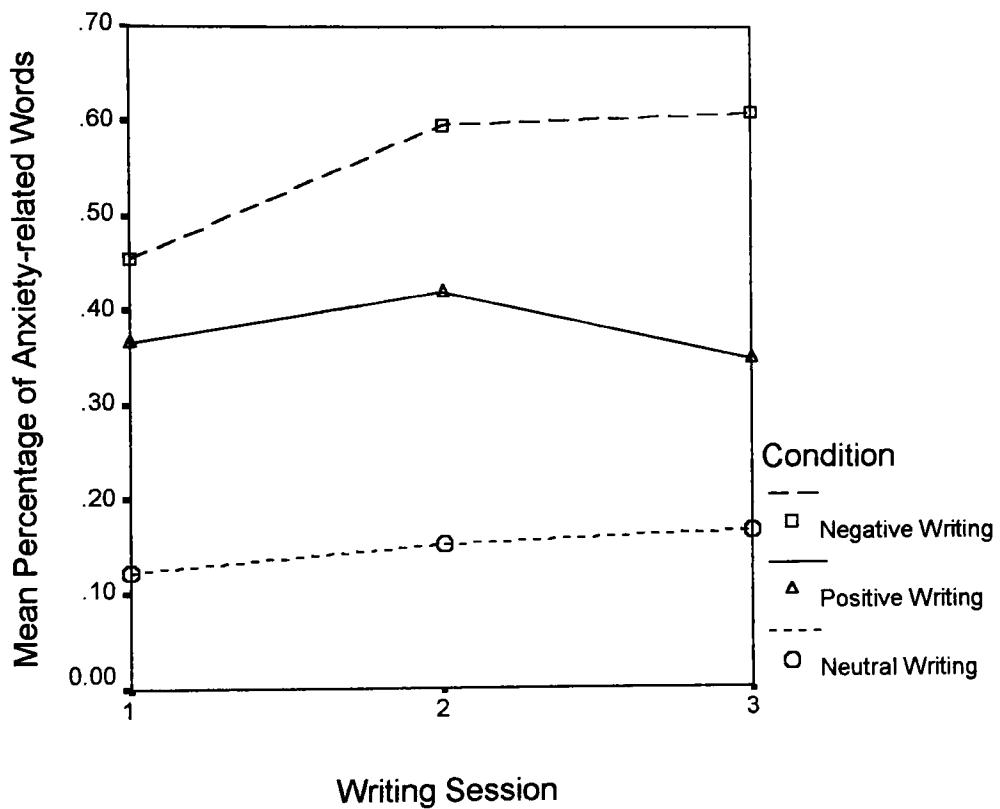


Figure 15. Mean percentage of anxiety-related words used as a function of writing session and experimental condition.

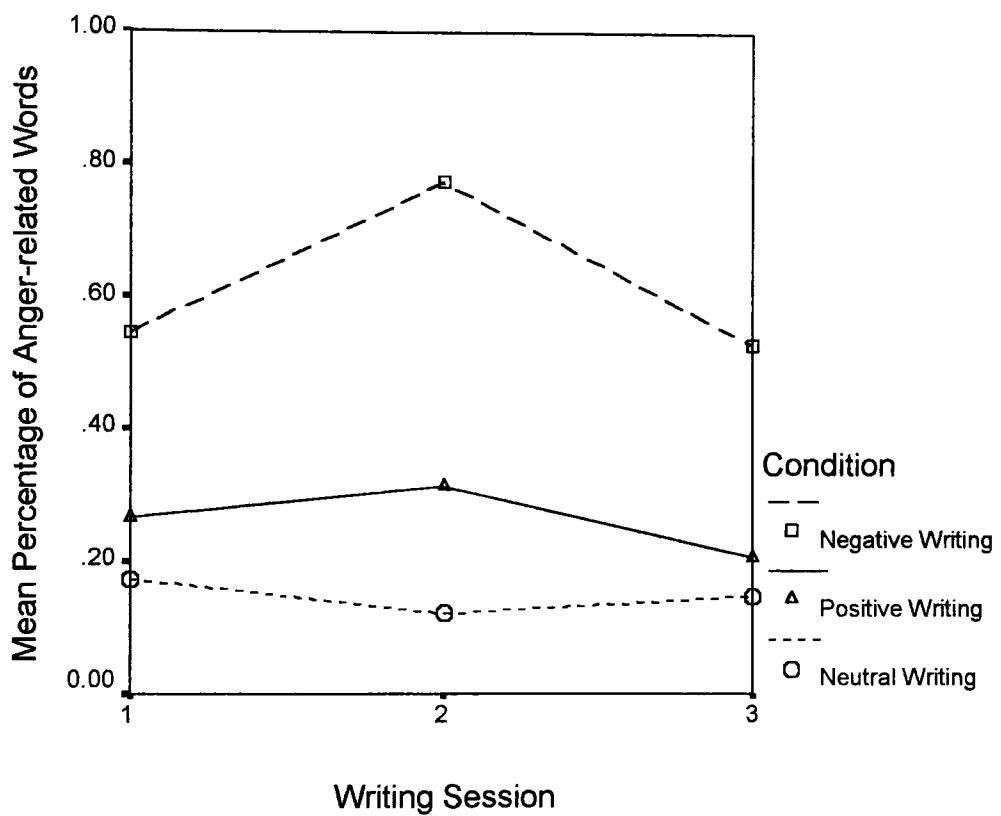


Figure 16. Mean percentage of anger-related words used as a function of writing session and experimental condition.

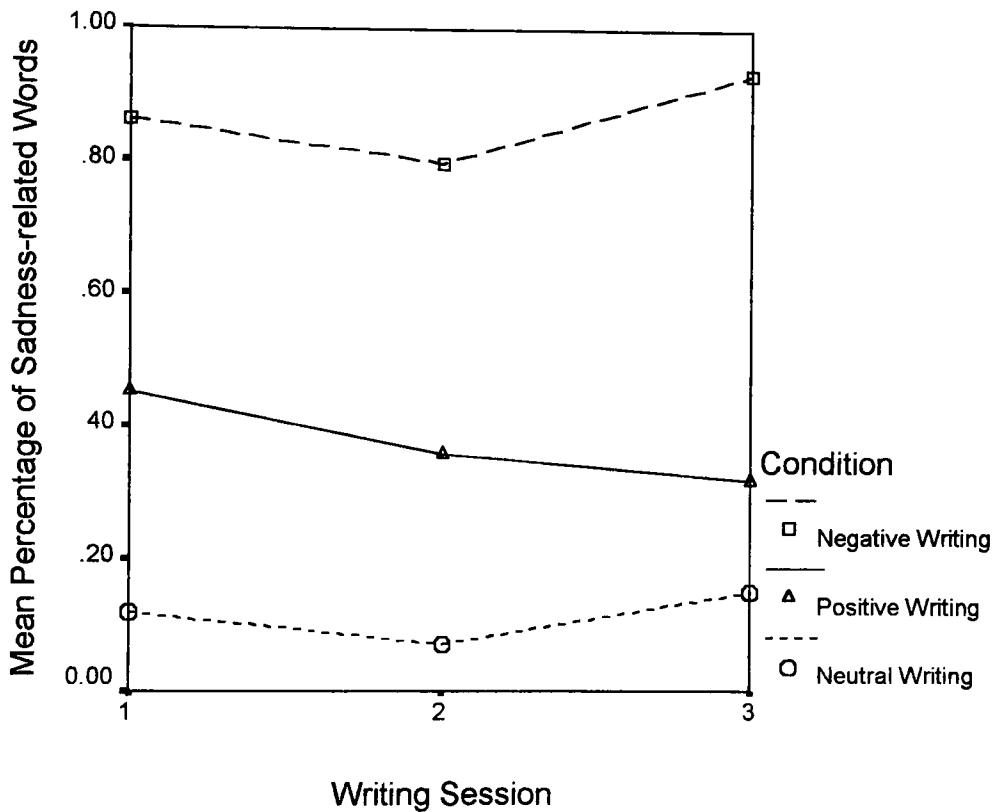


Figure 17. Mean percentage of sadness-related words used as a function of writing session and experimental condition.

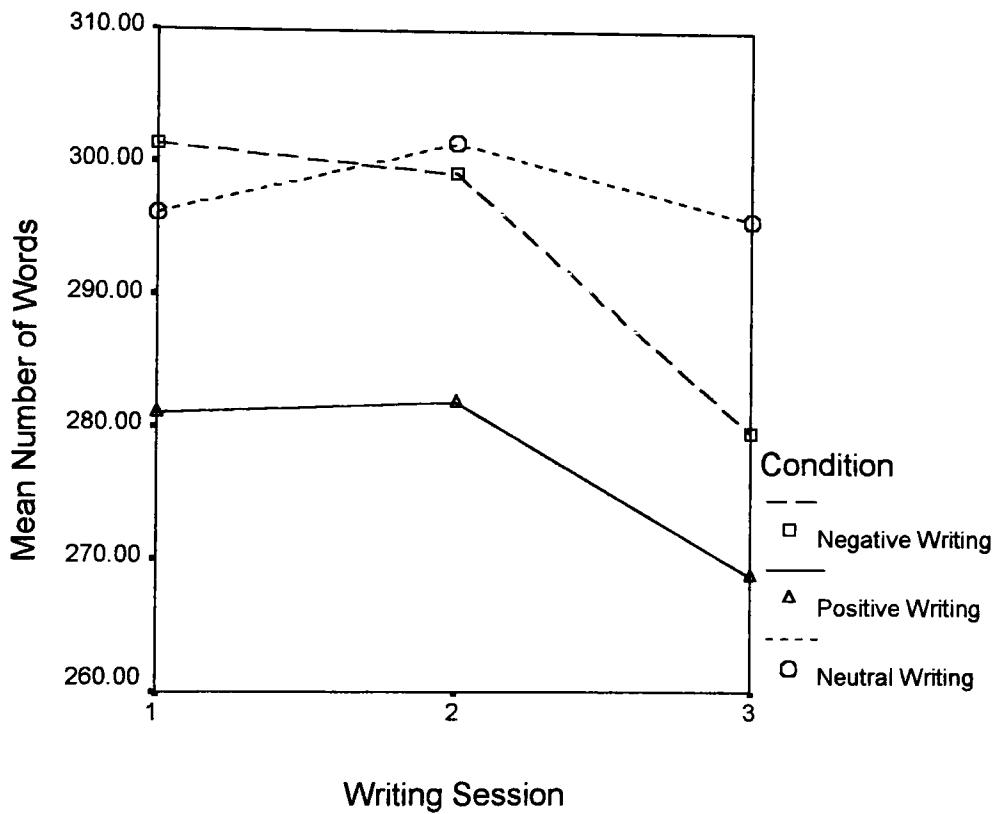


Figure 18. Mean number of total words used as a function of writing session and experimental condition.

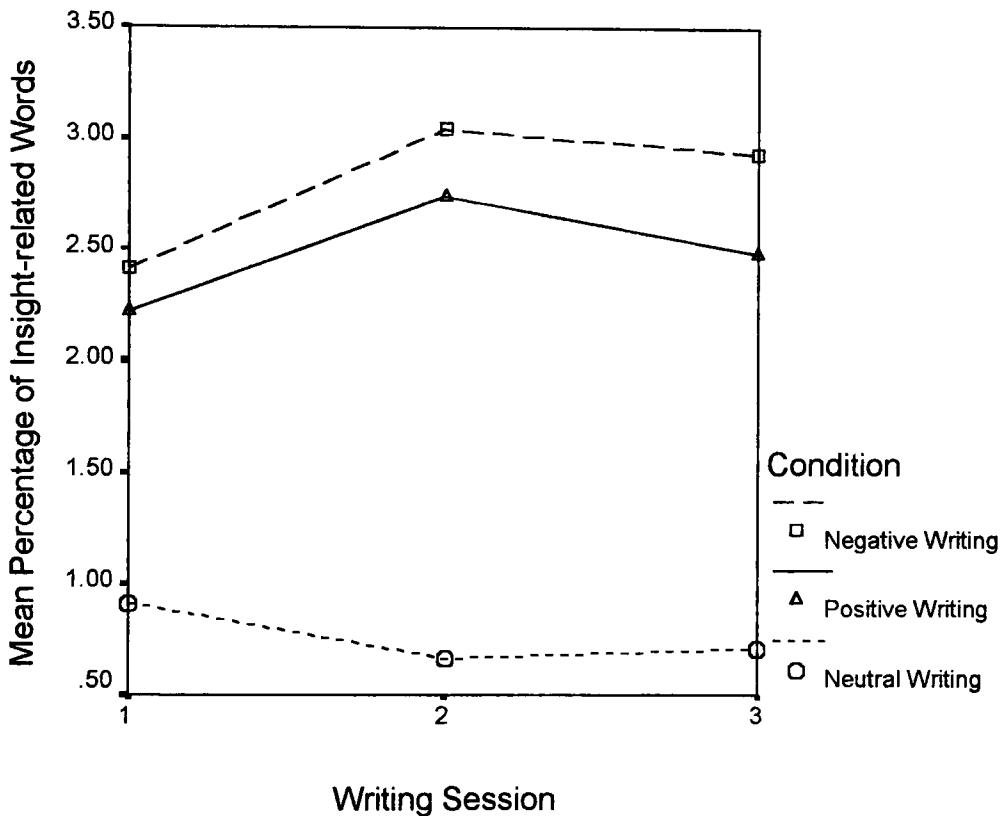


Figure 19. Mean percentage of insight-related words used as a function of writing session and experimental condition.

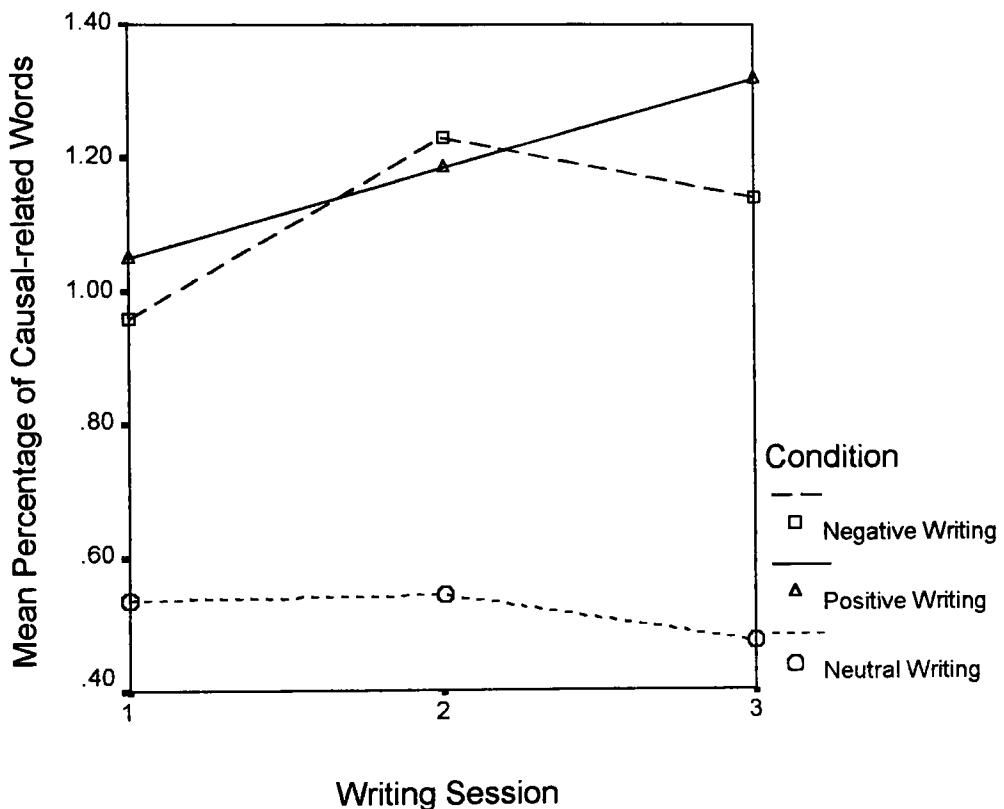


Figure 20. Mean percentage of causal-related words used as a function of writing session and experimental condition.

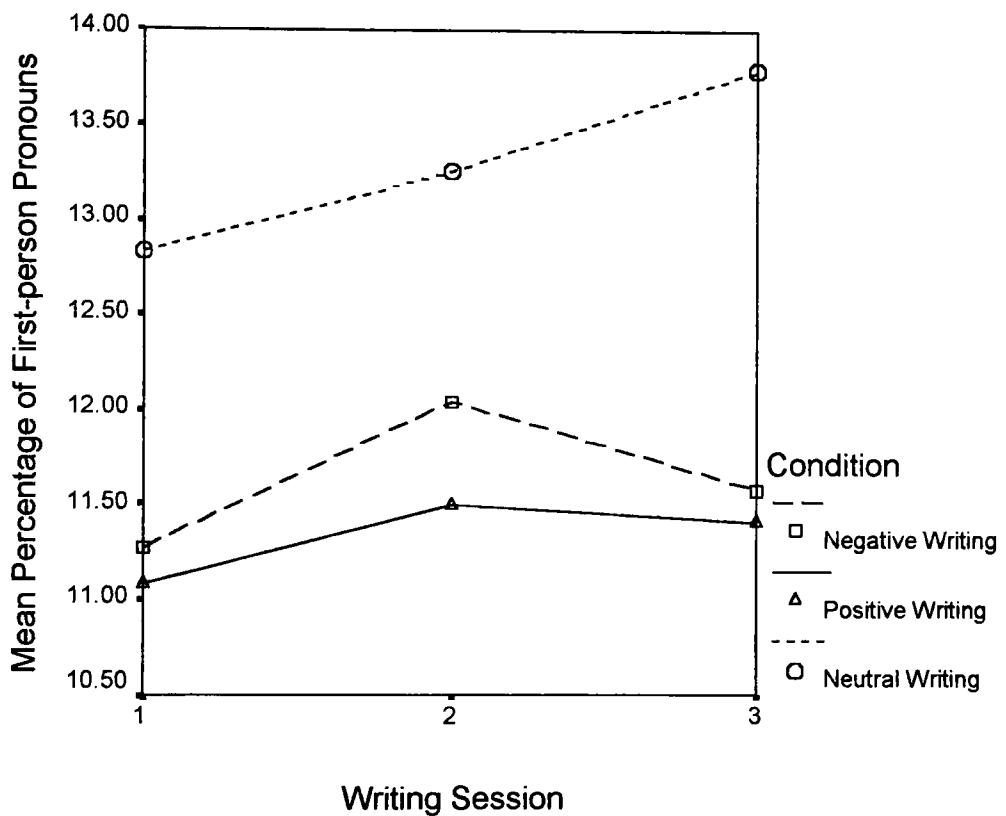


Figure 21. Mean percentage of first-person pronouns used as a function of writing session and experimental condition.

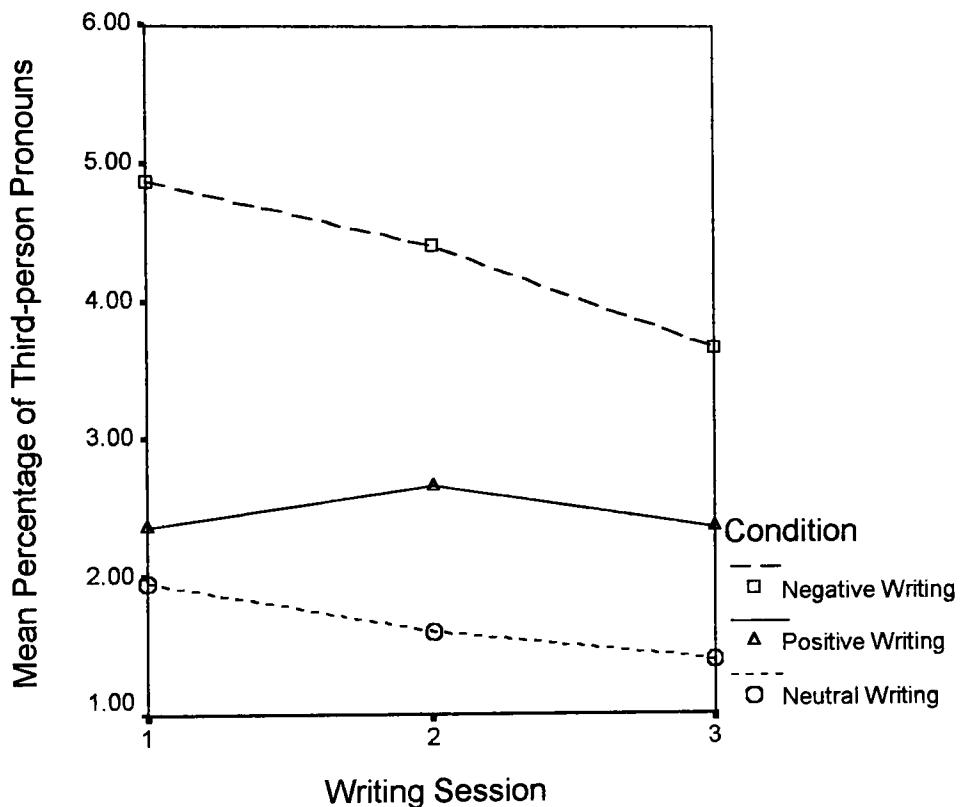


Figure 22. Mean percentage of third-person pronouns used as a function of writing session and experimental condition.

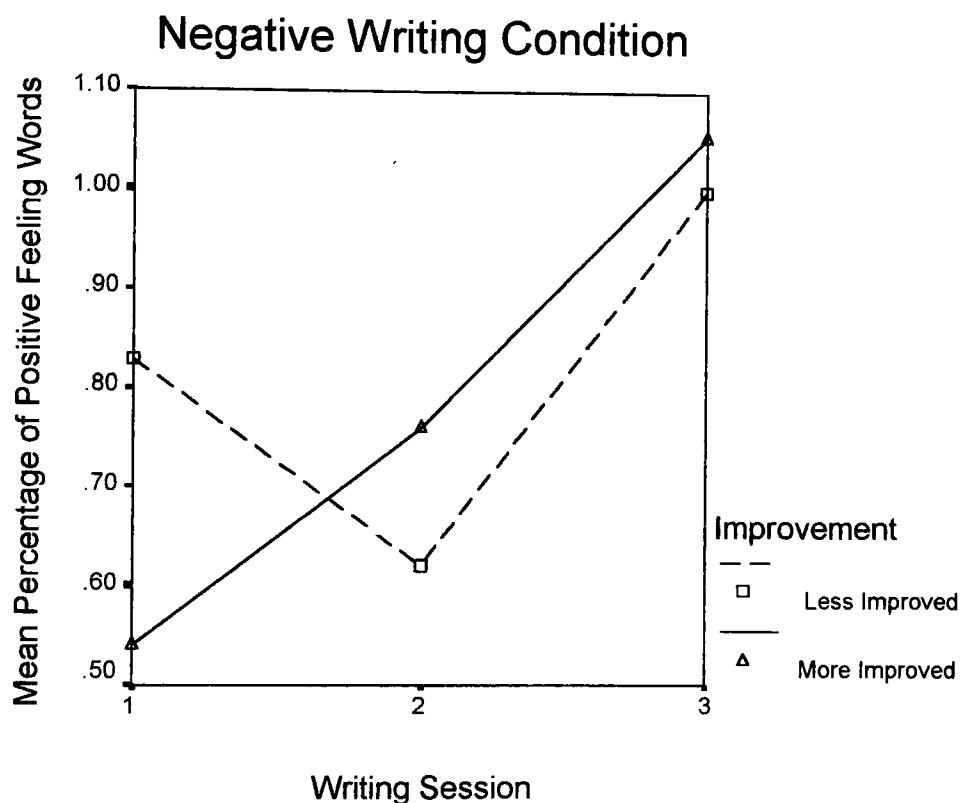
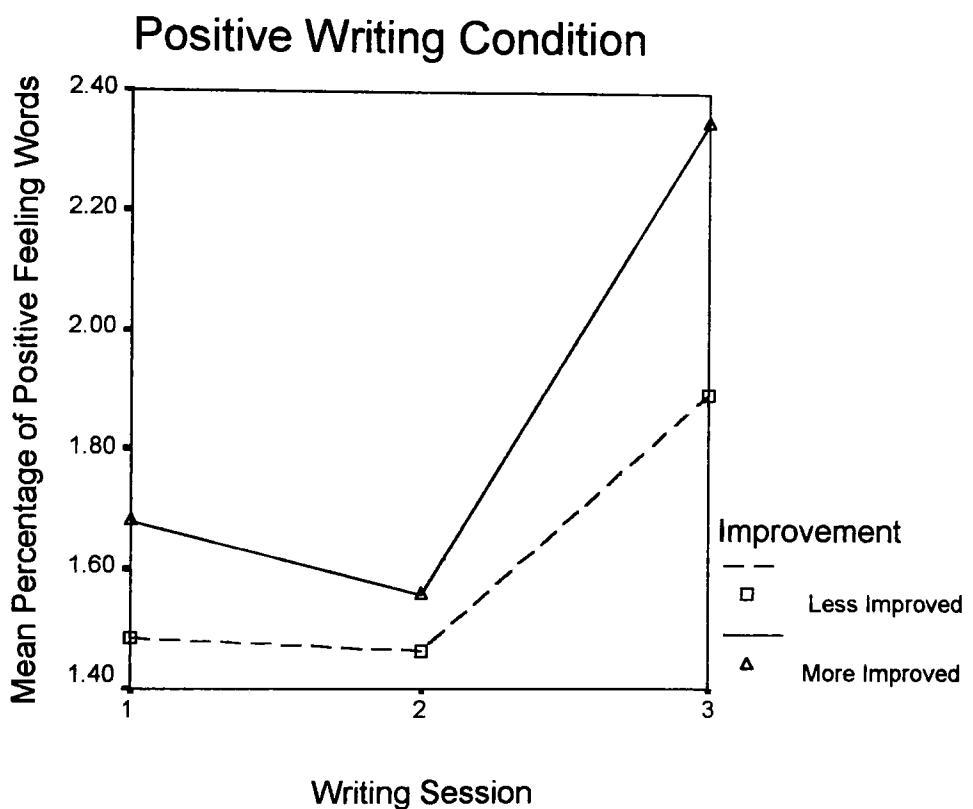


Figure 23. Mean percentage of positive feeling words used by the negative writing condition as a function of writing session and improvement status.



**Figure 24.** Mean percentage of positive feeling words used by the positive writing condition as a function of writing session and improvement status.

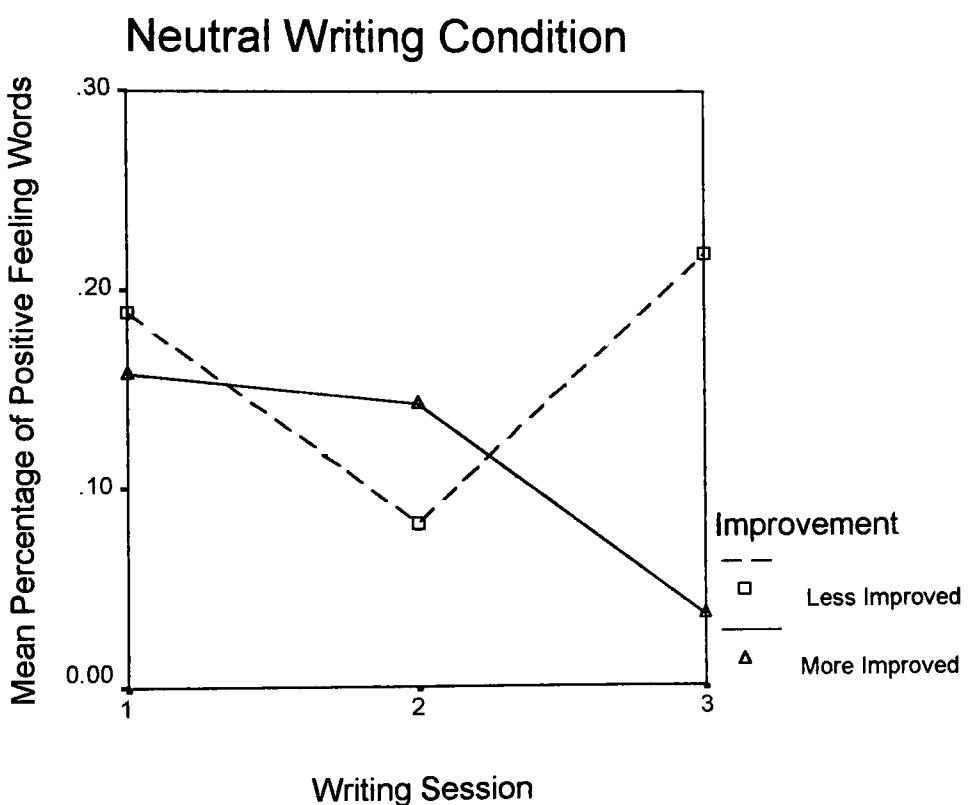


Figure 25. Mean percentage of positive feeling words used by the neutral writing condition as a function of writing session and improvement status.

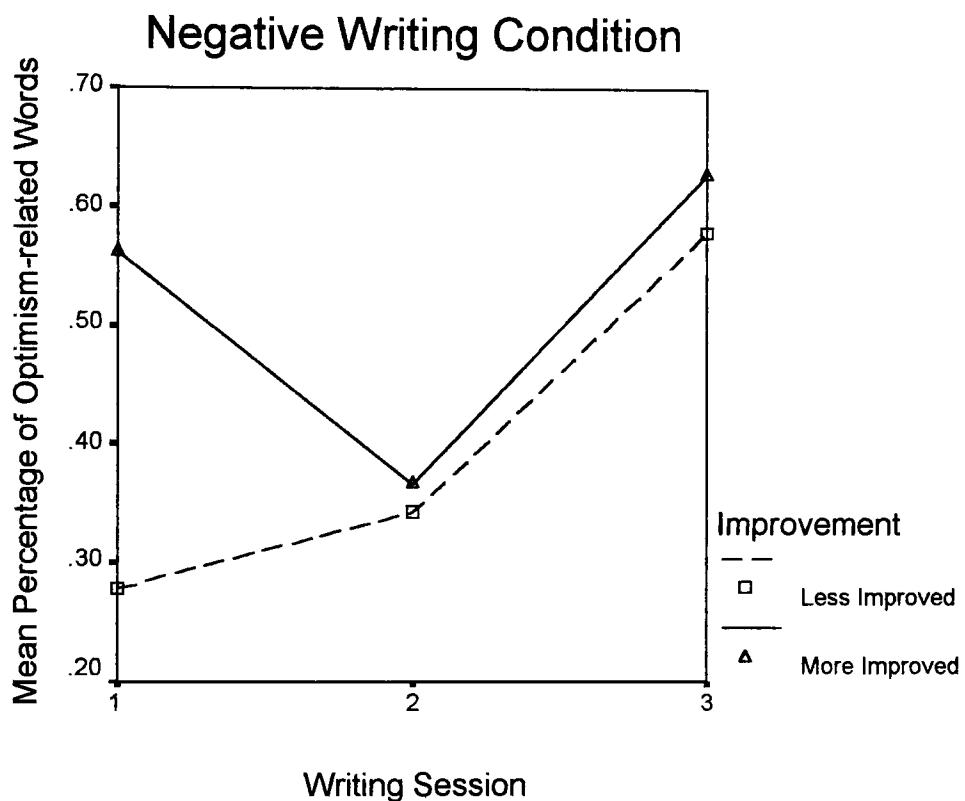
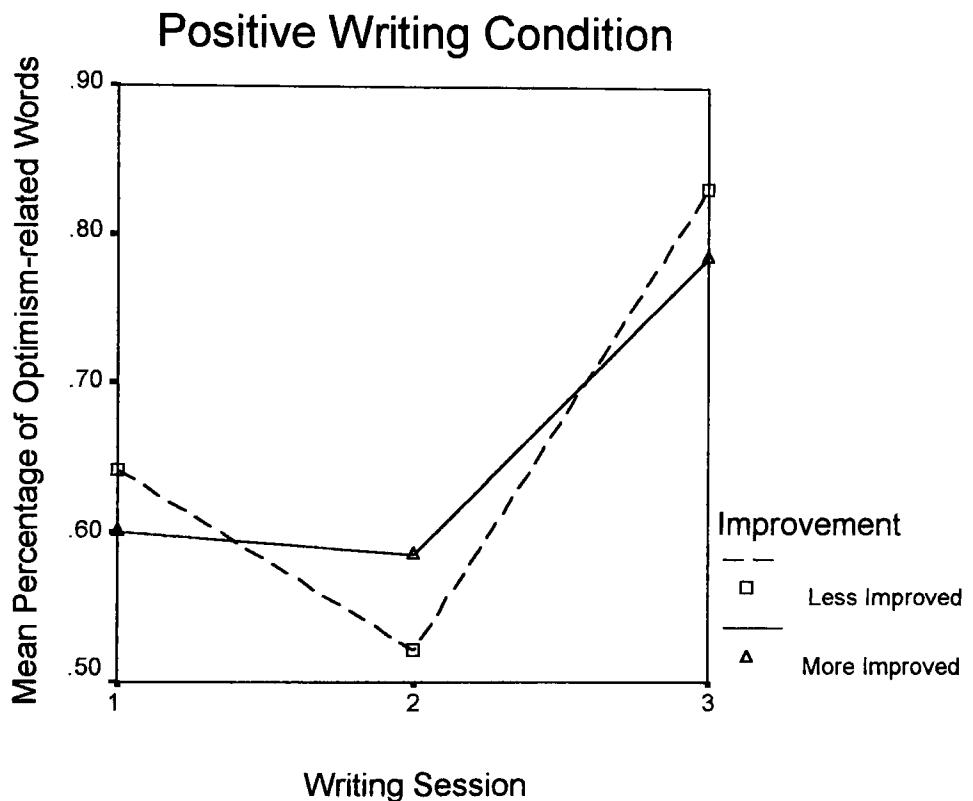
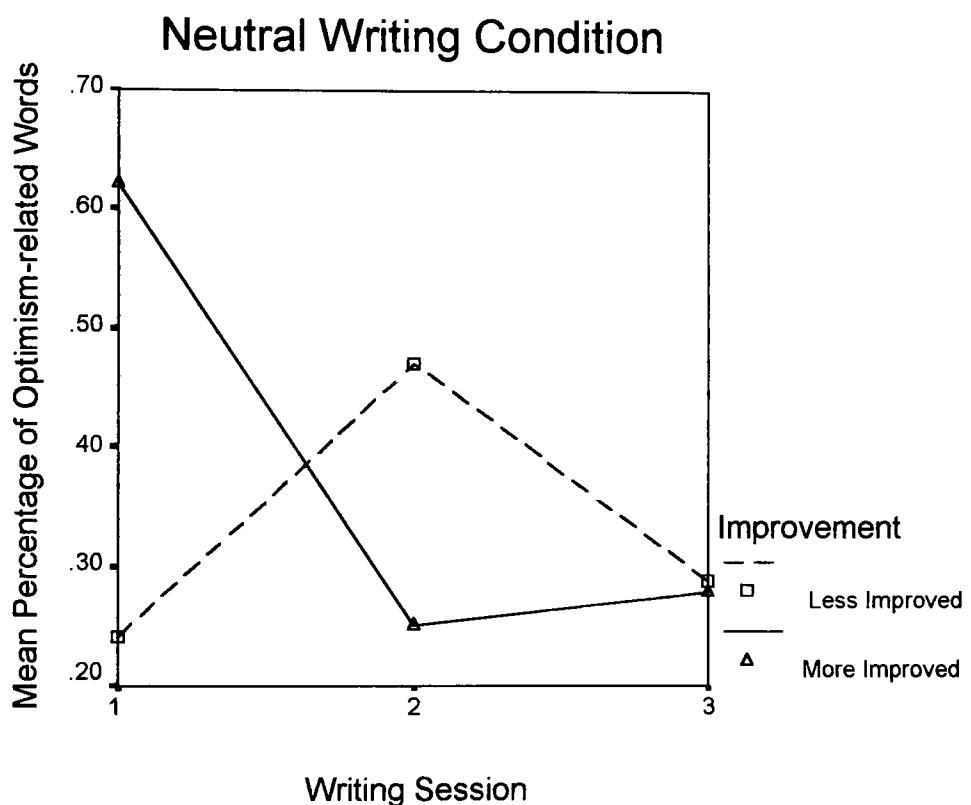


Figure 26. Mean percentage of optimism-related words used by the negative writing condition as a function of writing session and improvement status.



**Figure 27.** Mean percentage of optimism-related words used by the positive writing condition as a function of writing session and improvement status.



**Figure 28.** Mean percentage of optimism-related words used by the neutral writing condition as a function of writing session and improvement status.

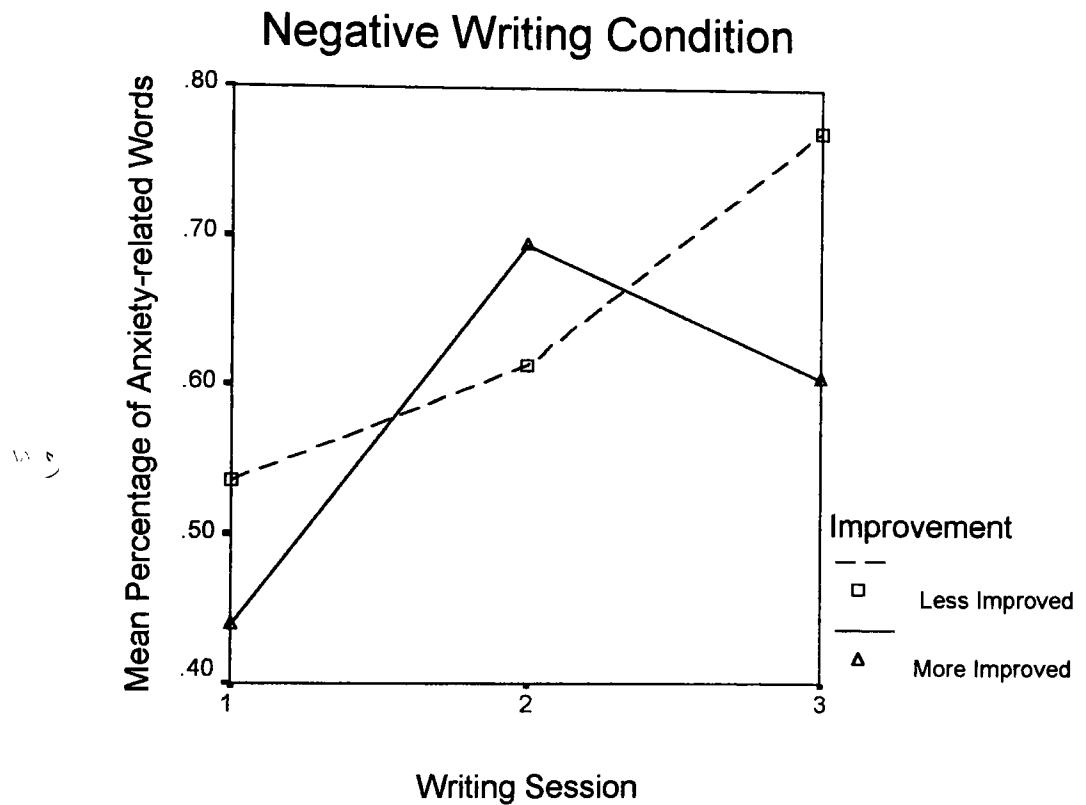
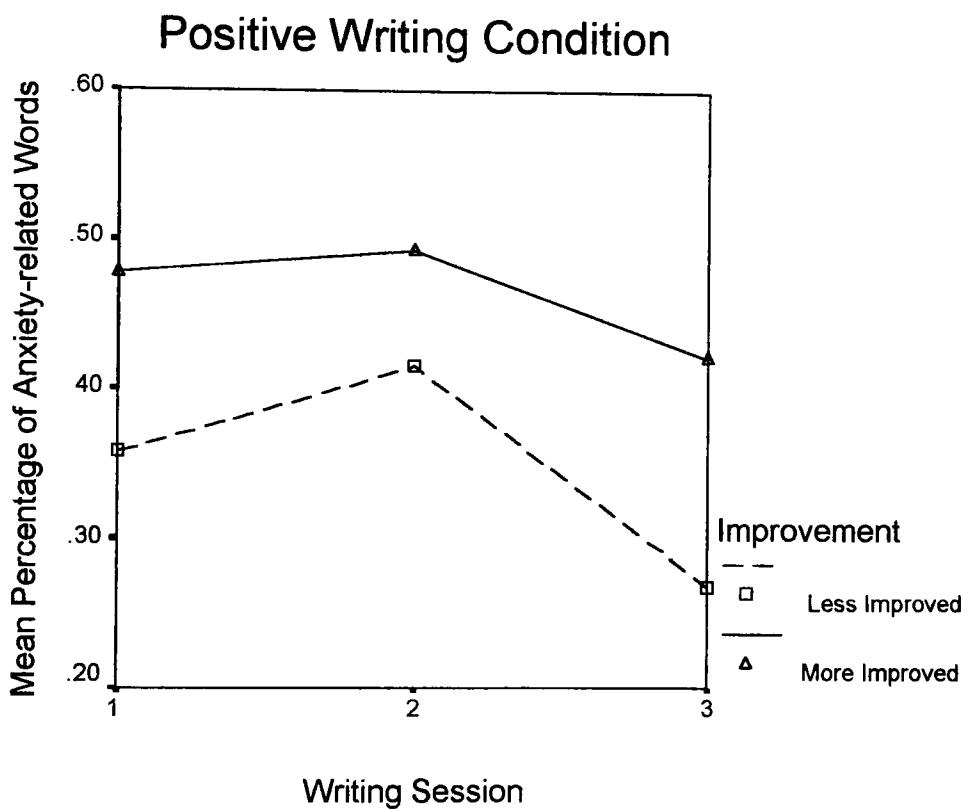


Figure 29. Mean percentage of anxiety-related words used by the negative writing condition as a function of writing session and improvement status.



**Figure 30.** Mean percentage of anxiety-related words used by the positive writing condition as a function of writing session and improvement status.

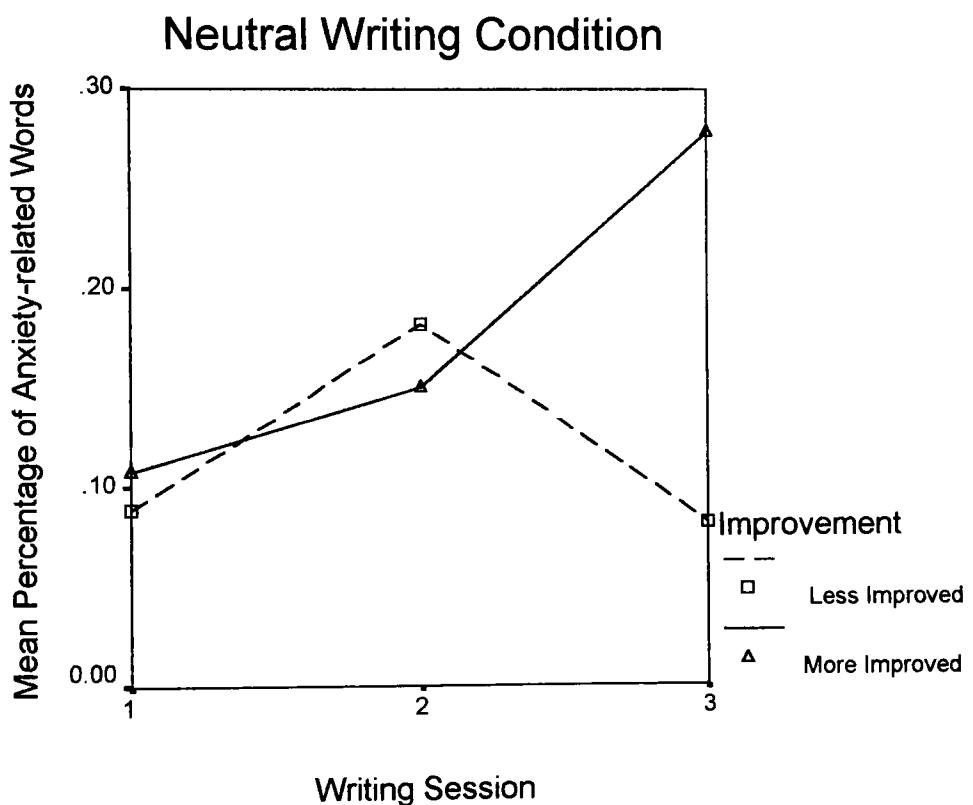


Figure 31. Mean percentage of anxiety-related words used by the neutral writing condition as a function of writing session and improvement status.

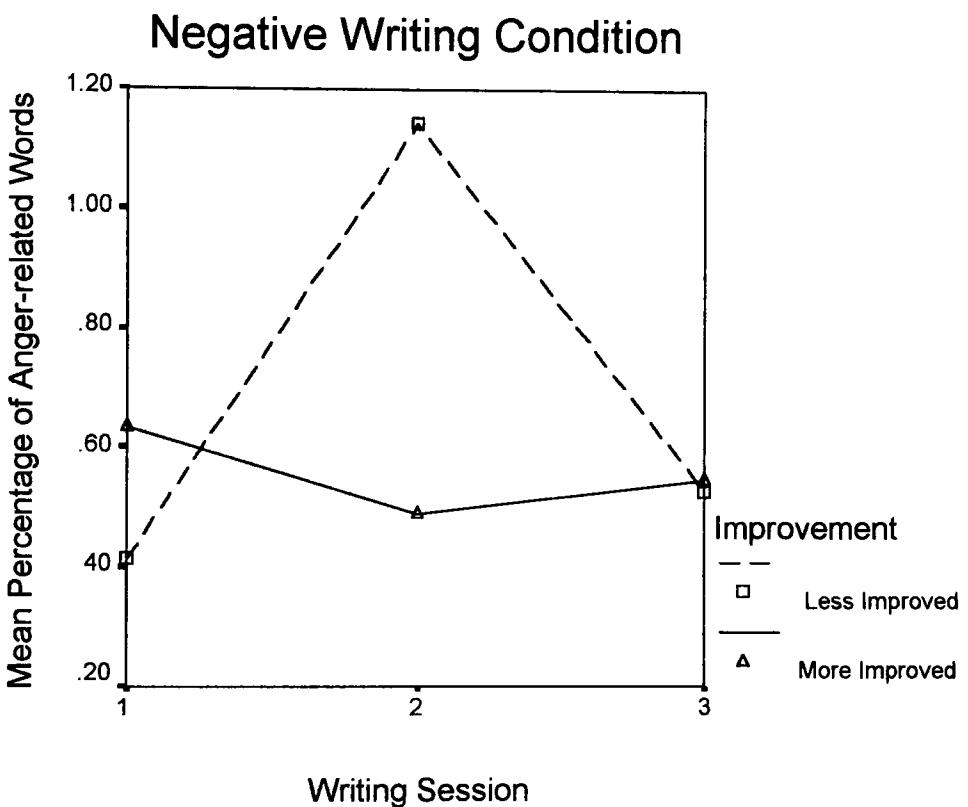


Figure 32. Mean percentage of anger-related words used by the negative writing condition as a function of writing session and improvement status.

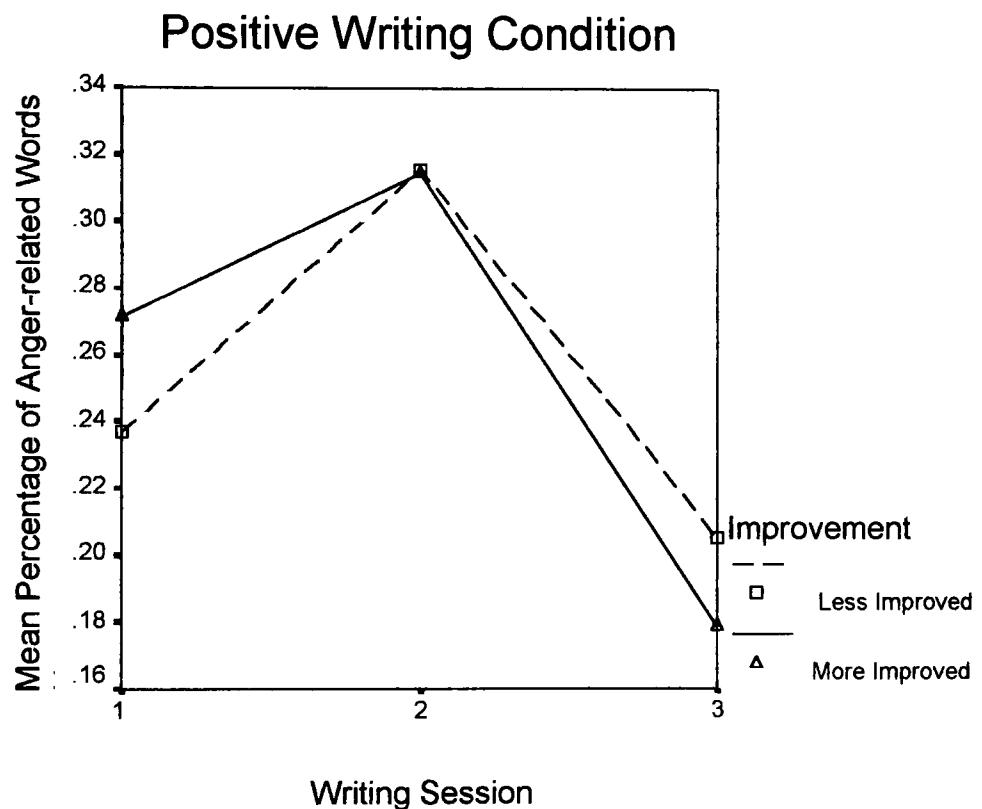


Figure 33. Mean percentage of anger-related words used by the positive writing condition as a function of writing session and improvement status.

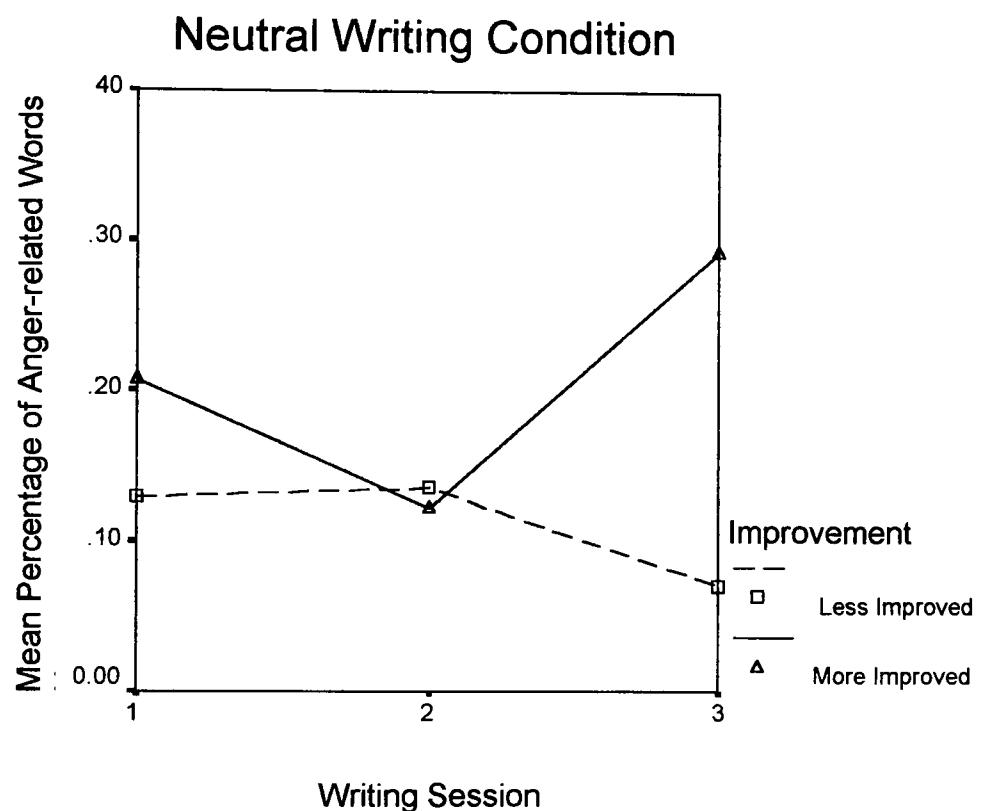


Figure 34. Mean percentage of anger-related words used by the neutral writing condition as a function of writing session and improvement status.

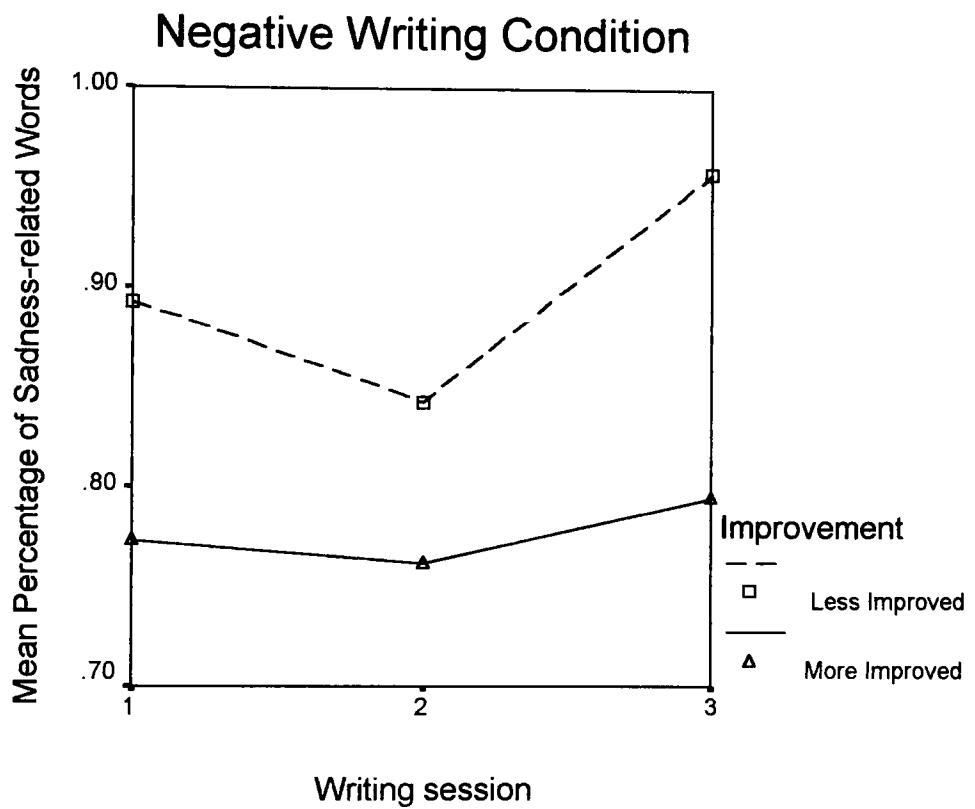


Figure 35. Mean percentage of sadness-related words used by the negative writing condition as a function of writing session and improvement status.

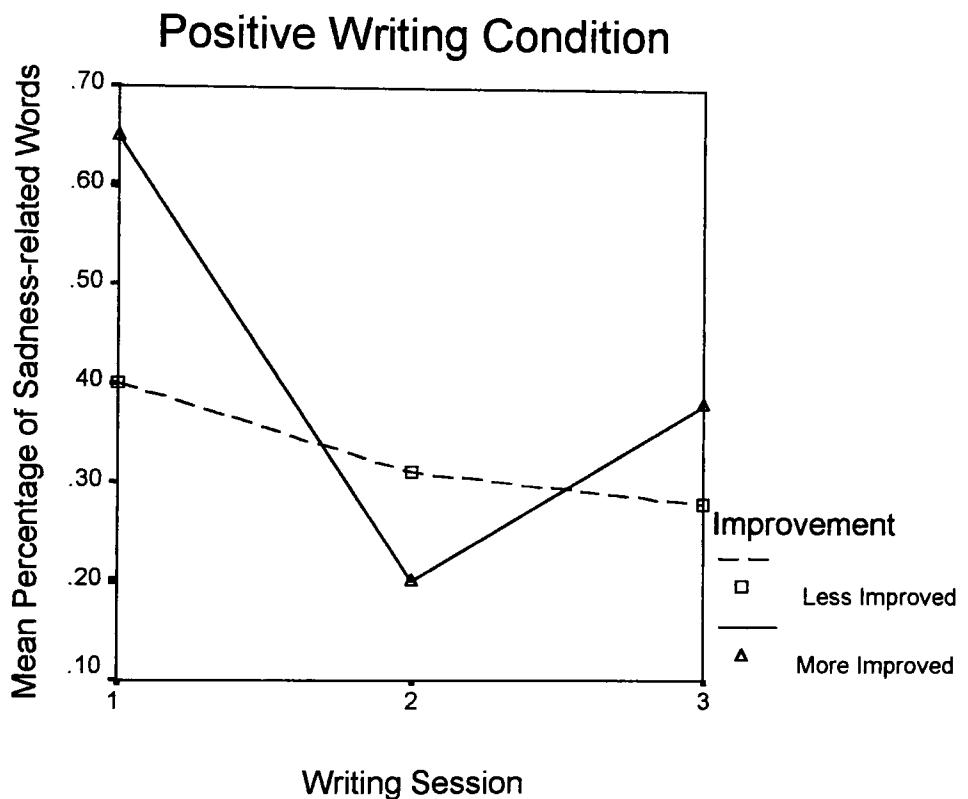


Figure 36. Mean percentage of sadness-related words used by the positive writing condition as a function of writing session and improvement status.

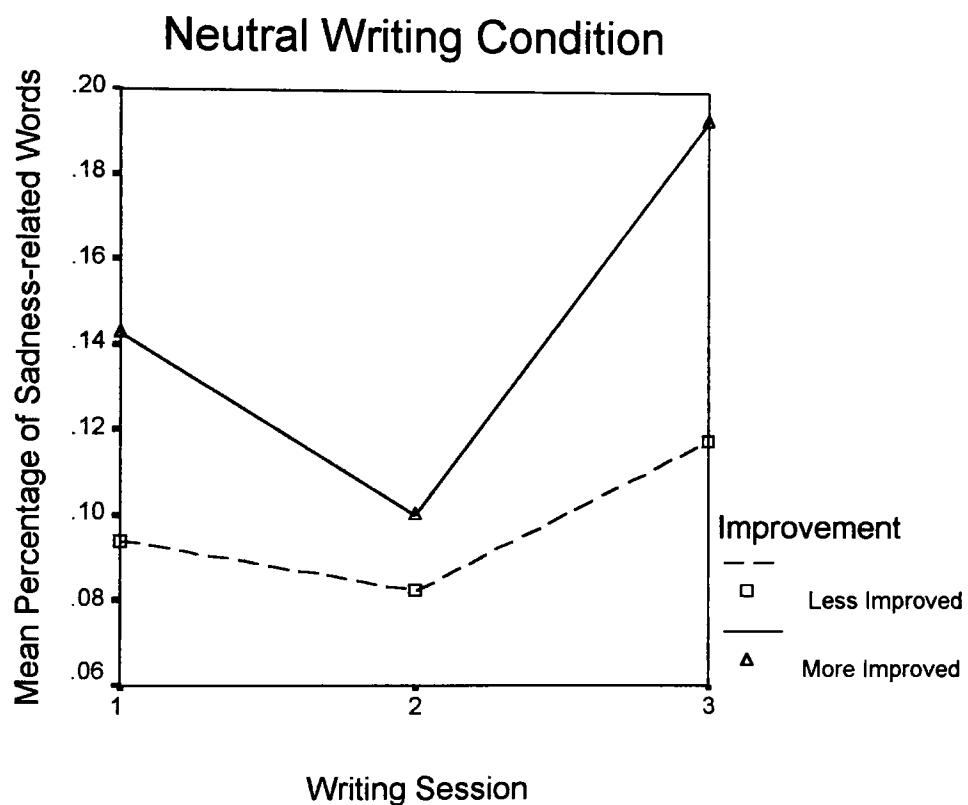


Figure 37. Mean percentage of sadness-related words used by the neutral writing condition as a function of writing session and improvement status.

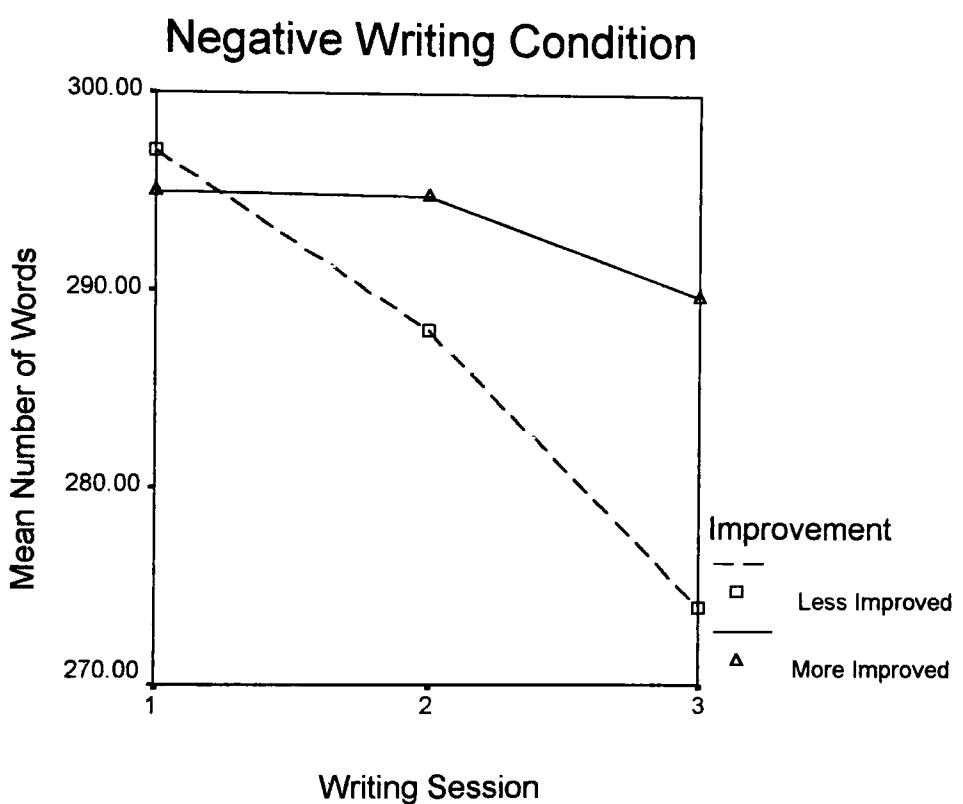


Figure 38. Mean number of total words used by the negative writing condition as a function of writing session and improvement status.

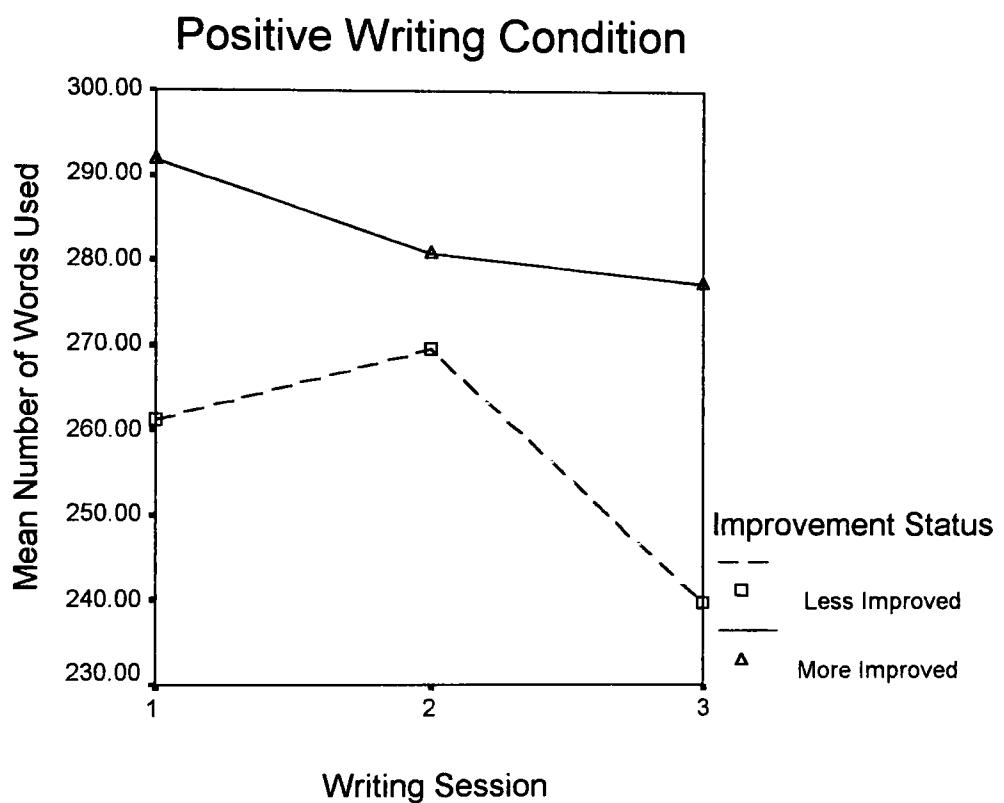


Figure 39. Mean number of total words used by the positive writing condition as a function of writing session and improvement status.

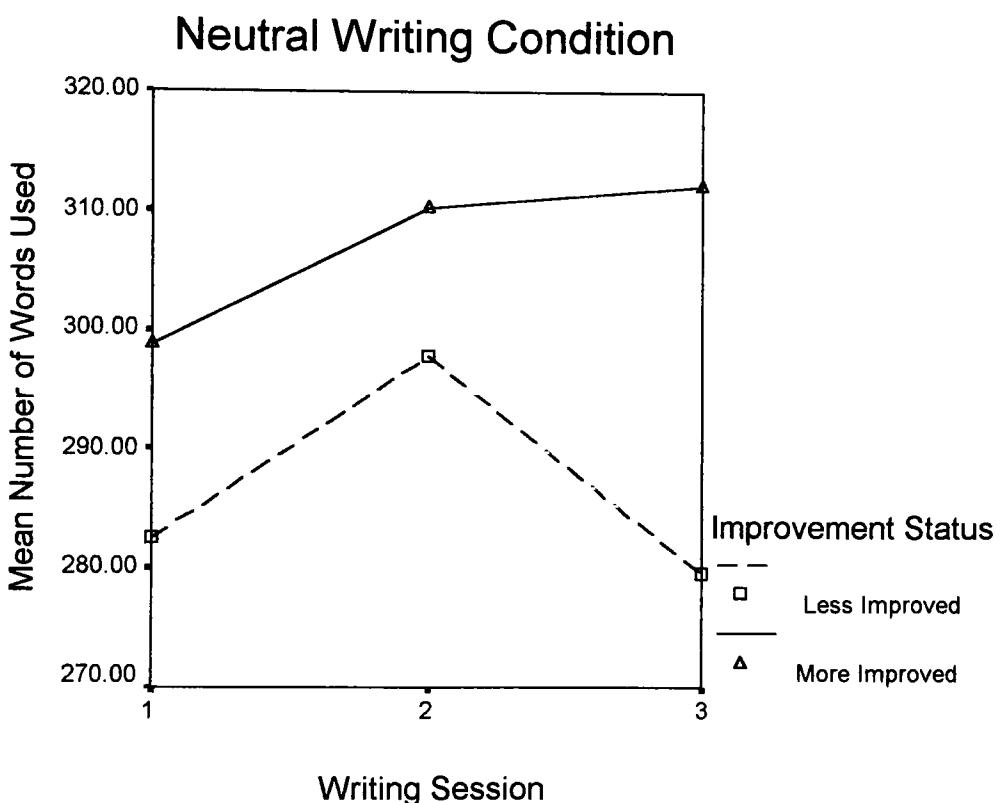


Figure 40. Mean number of total words used by the neutral writing condition as a function of writing session and improvement status.

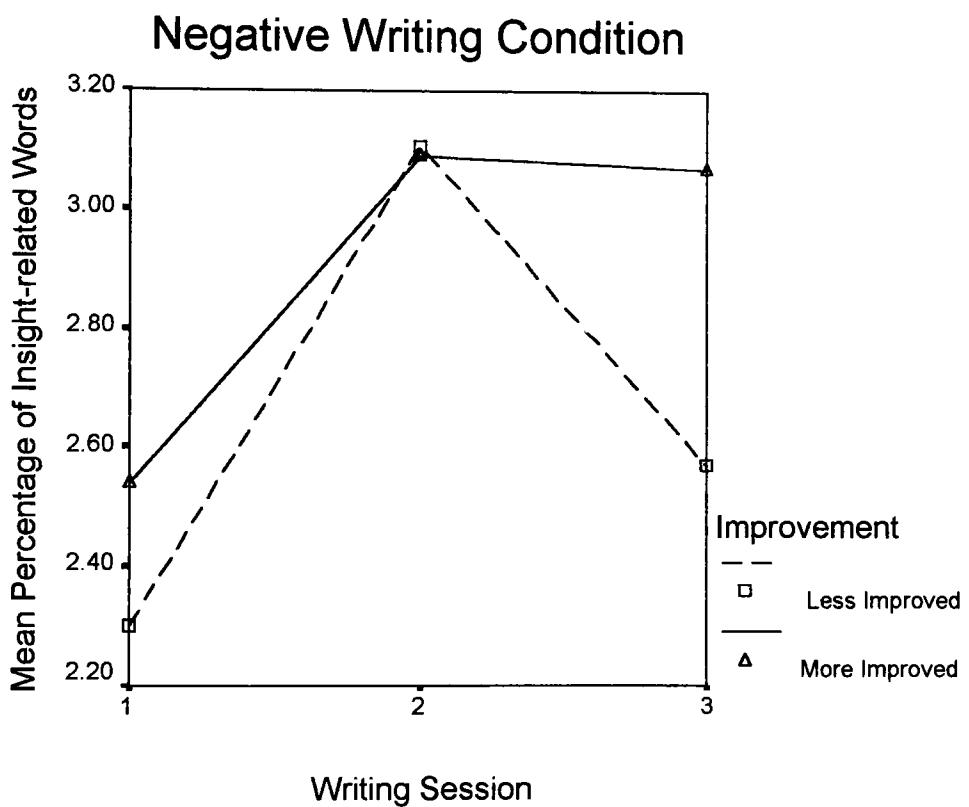


Figure 41. Mean percentage of insight-related words used by the negative writing condition as a function of writing session and improvement status.

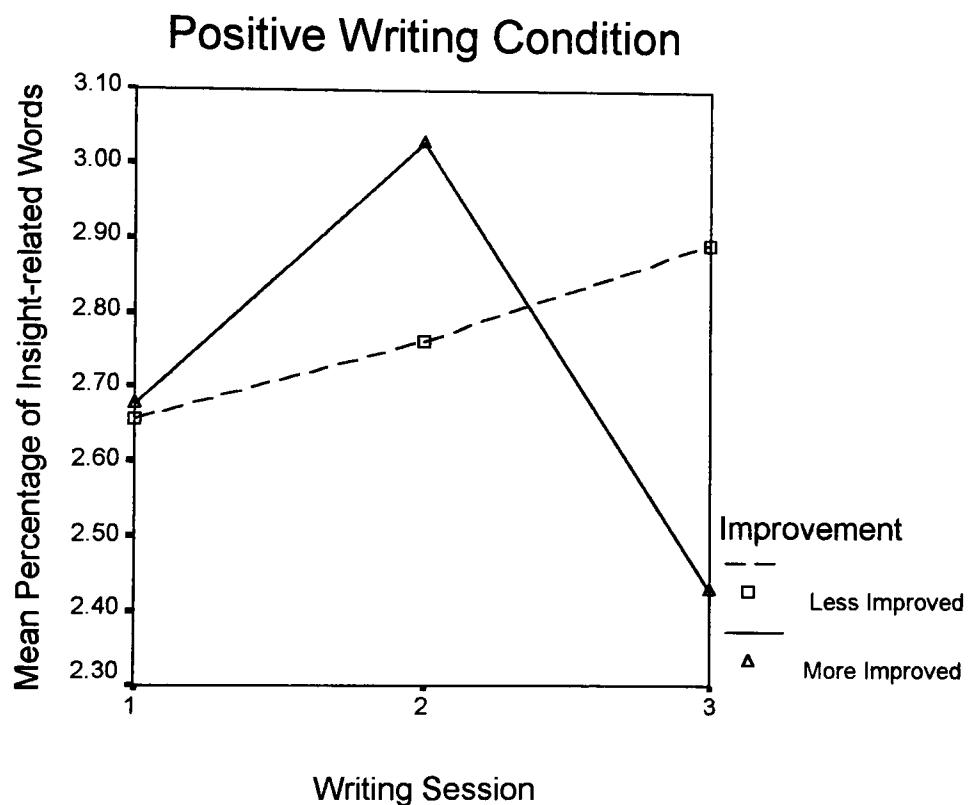
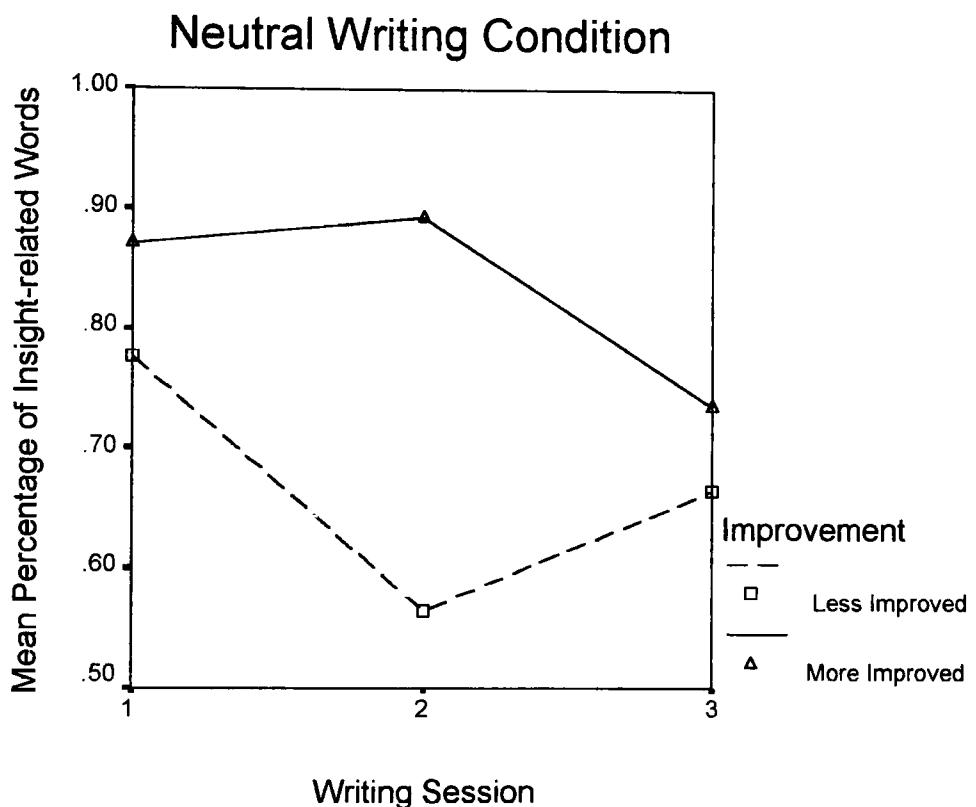
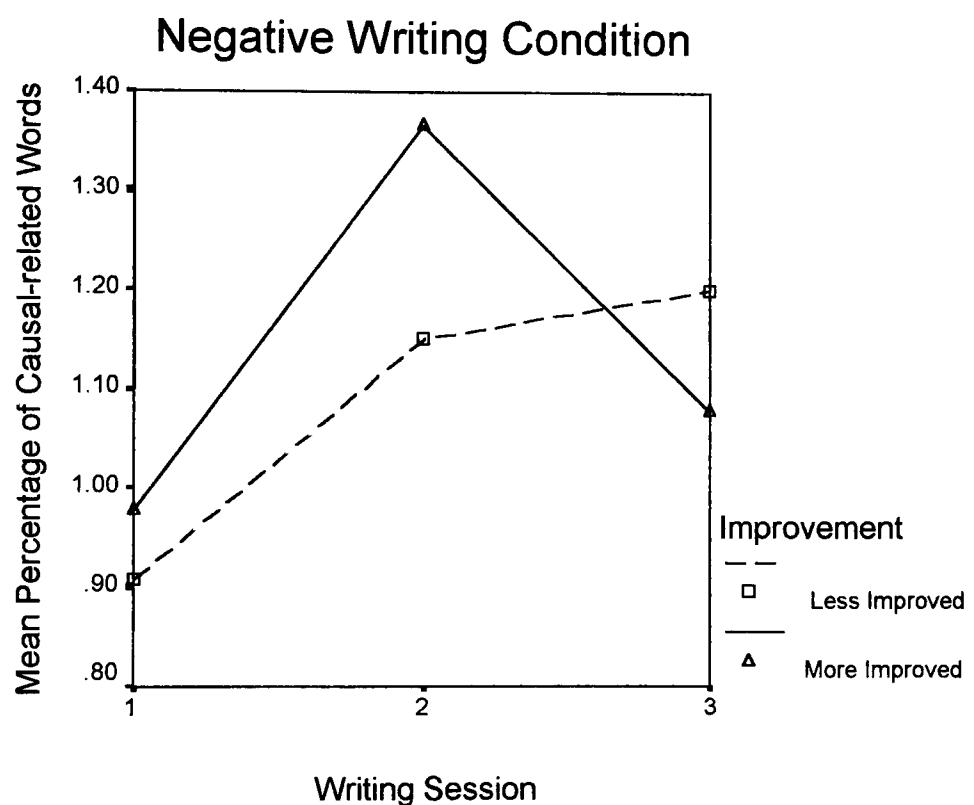


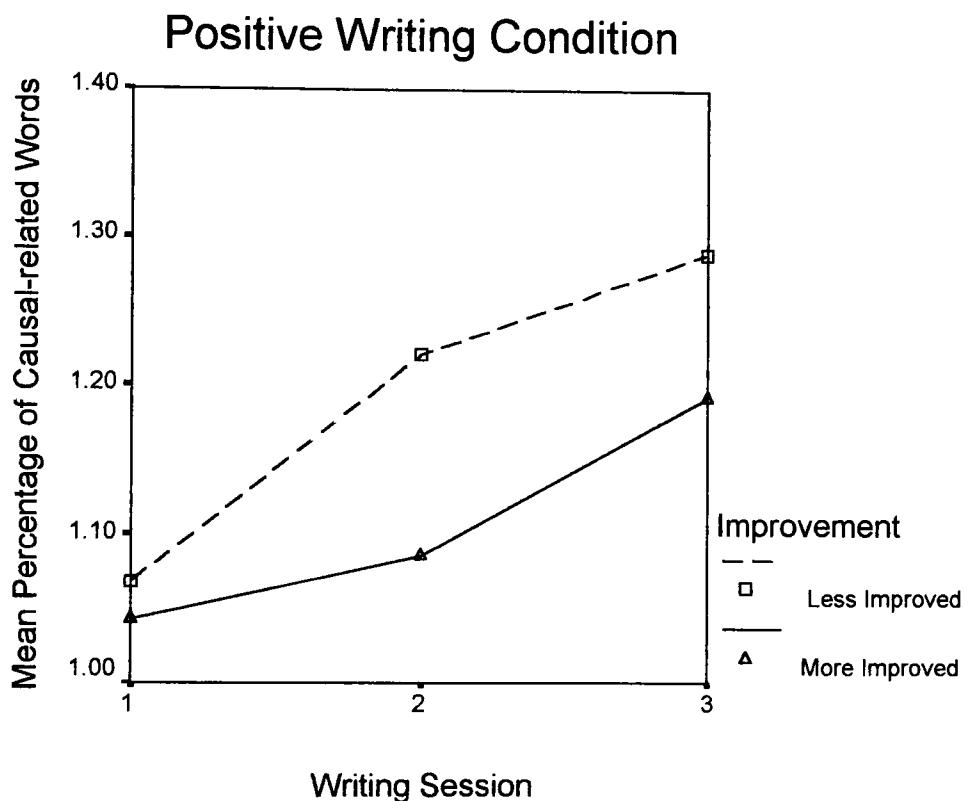
Figure 42. Mean percentage of insight-related words used by the positive writing condition as a function of writing session and improvement status.



**Figure 43.** Mean percentage of insight-related words used by the neutral writing condition as a function of writing session and improvement status.



**Figure 44.** Mean percentage of causal-related words used by the negative writing condition as a function of writing session and improvement status.



**Figure 45.** Mean percentage of causal-related words used by the positive writing condition as a function of writing session and improvement status.

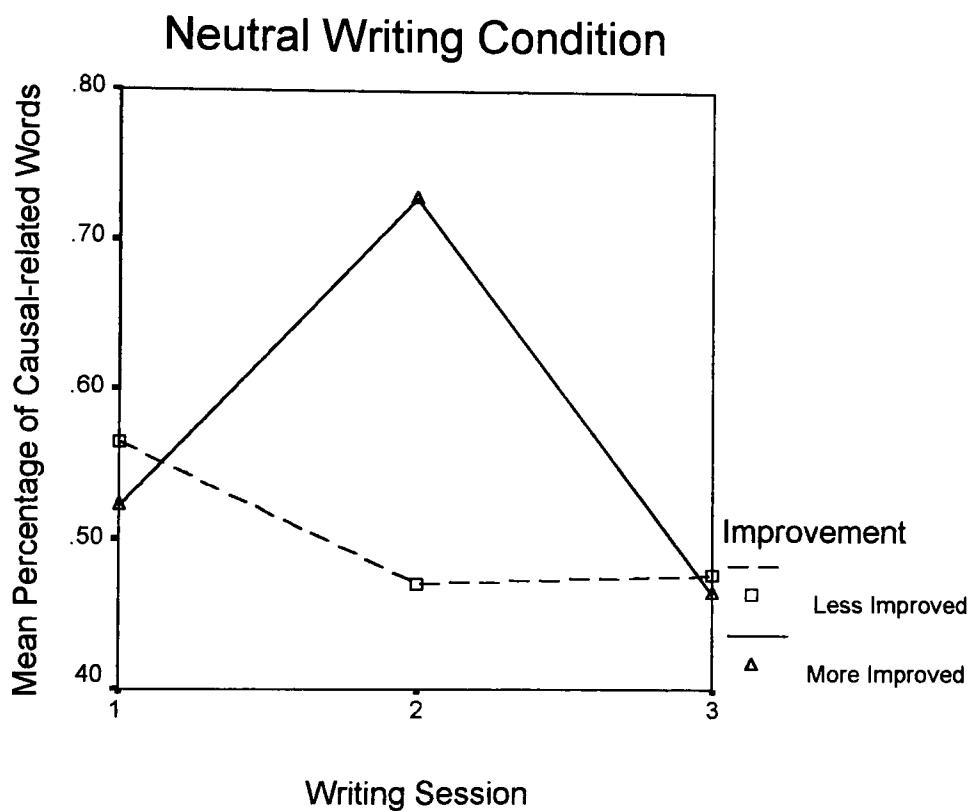
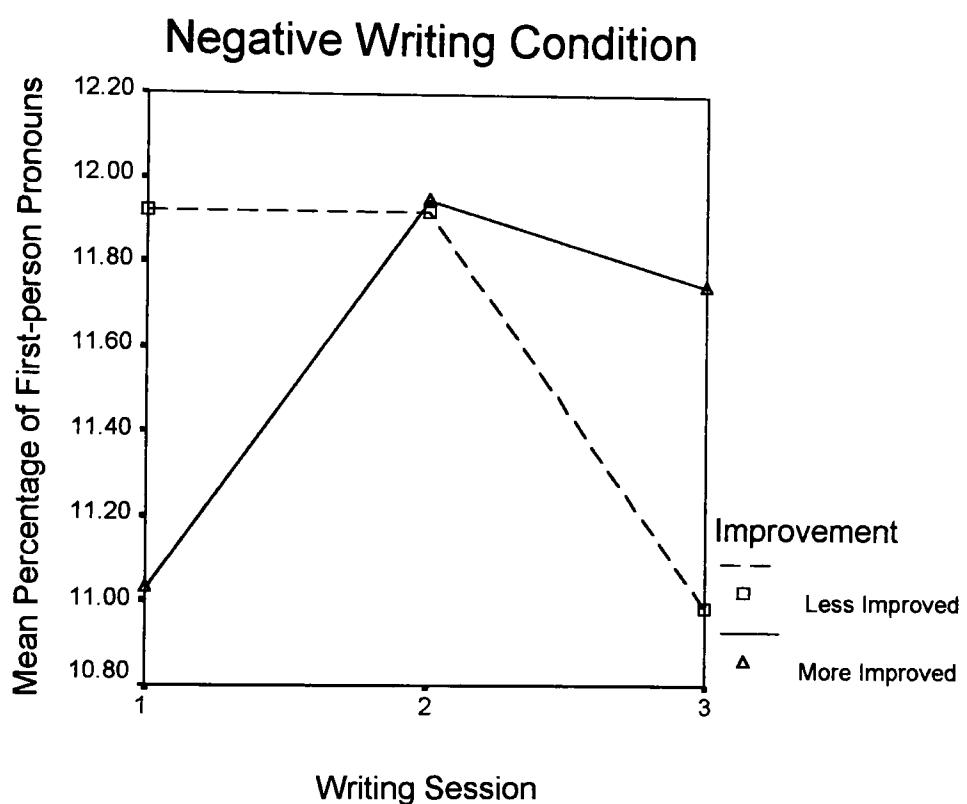


Figure 46. Mean percentage of causal-related words used by the neutral writing condition as a function of writing session and improvement status.



**Figure 47.** Mean percentage of first-person pronouns used by the negative writing condition as a function of writing session and improvement status.

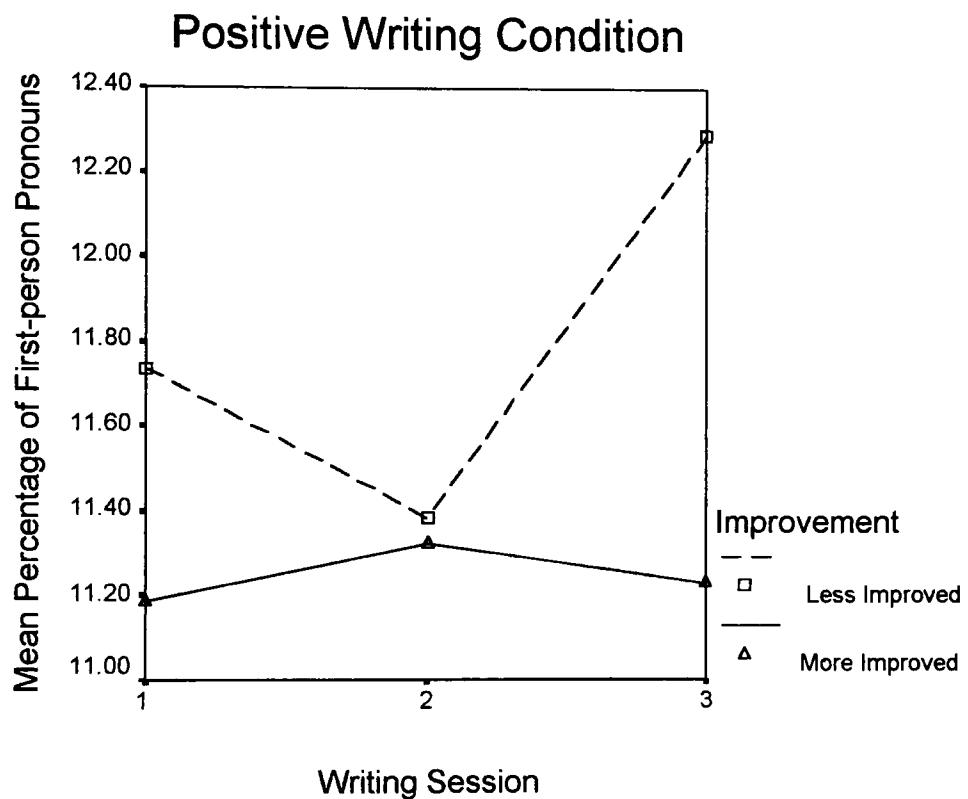
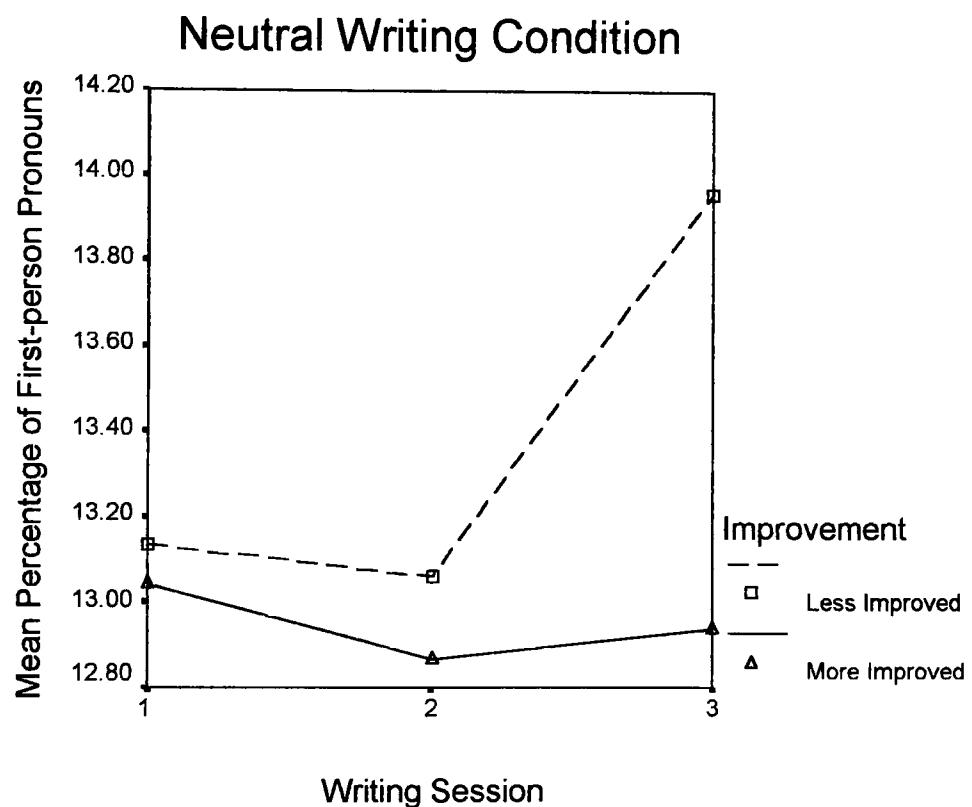


Figure 48. Mean percentage of first-person pronouns used by the positive writing condition as a function of writing session and improvement status.



**Figure 49.** Mean percentage of first-person pronouns used by the neutral writing condition as a function of writing session and improvement status.

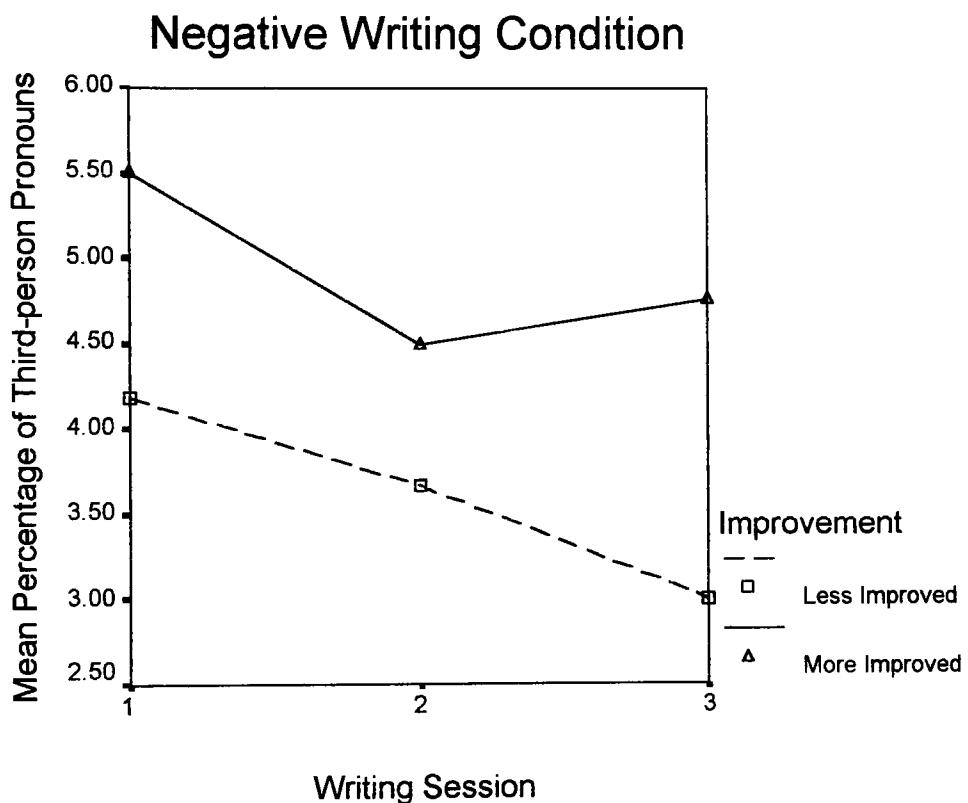


Figure 50. Mean percentage of third-person pronouns used by the negative writing condition as a function of writing session and improvement status.

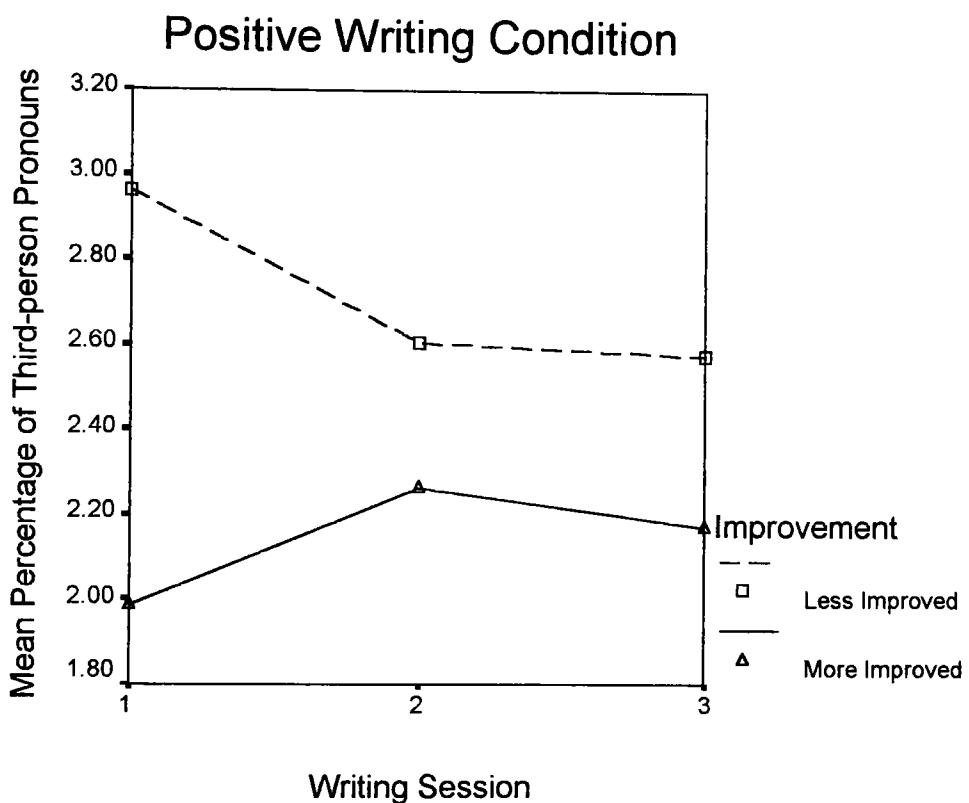


Figure 51. Mean percentage of third-person pronouns used by the positive writing condition as a function of writing session and improvement status.

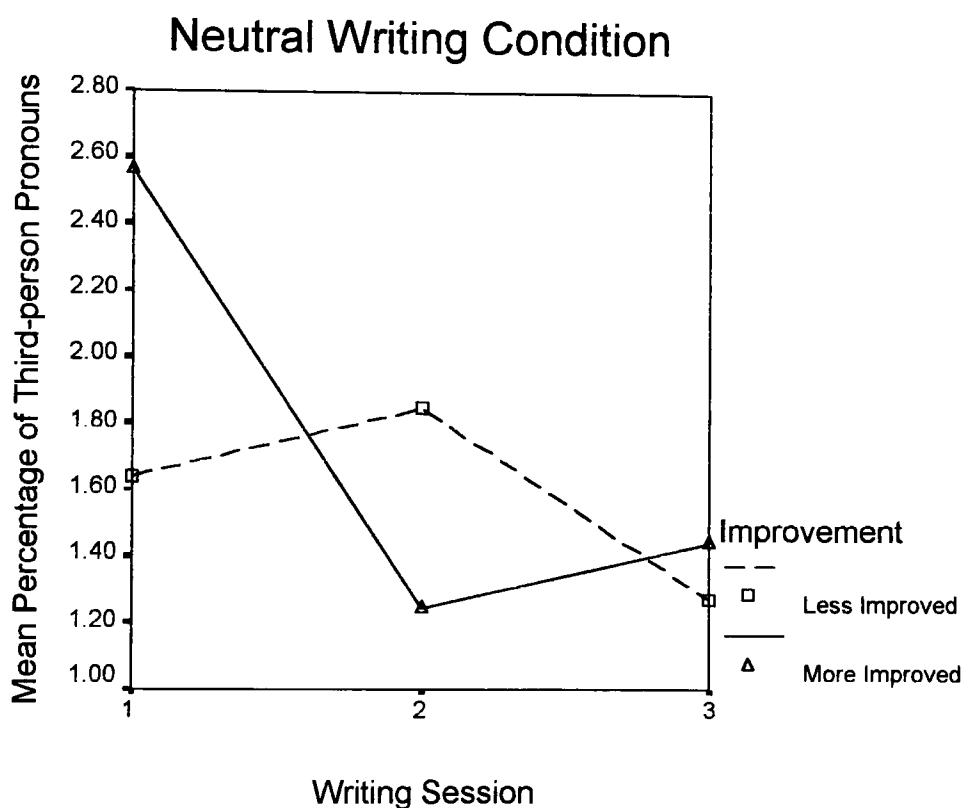


Figure 52. Mean percentage of third-person pronouns used by the neutral writing condition as a function of writing session and improvement status.

## CHAPTER IV

### DISCUSSION

The present study investigated the relationship between narrative content in positive and negative written emotional expression and long-term improvements in mood, cognitions, and psychological symptomatology in individuals who have experienced a severe trauma. Generalizing from cognitive-behavioral theory (e.g., Beck, 1967; Ellis & Grieger, 1977; Lewinsohn et al., 1976) it was hypothesized that those who wrote about positive events would exhibit long-term improvements in mood, self-cognitions, and psychological symptomatology. Based on previous research which has examined the theories proposed by Pennebaker (Donnelly & Murray, 1991; Esterling et al., 1994; Greenberg & Stone, 1992; Kelley et al., 1997; Murray et al., 1989; Pennebaker, 1993; Pennebaker & Beall, 1986; Pennebaker et al., 1990; Pennebaker & Francis, 1996; Pennebaker et al., 1997; Petrie et al., 1995; Spera et al., 1994), it was further anticipated that those who wrote about negative events would evidence long-term improvements in mood, self-cognitions, and psychological symptomatology that would surpass the levels exhibited by those who wrote about neutral and positive events, and that these improvements would become more pronounced with the passage of time (Kelley et al., 1997).

Consistent with the assigned task, it was hypothesized that those who wrote about negative life events would use a greater percentage of negative emotion words when compared to the other two writing groups and that those who wrote about positive life events would use a greater percentage of positive emotion words when compared to the other two writing groups. It was further hypothesized that those who wrote about negative and positive life events would use a greater percentage of causal and insight words when compared to those who wrote about neutral events. Finally, with regard to

changes in word use over the course of the writing sessions, it was hypothesized that those who wrote about negative and positive life events would use fewer words, would use a greater percentage of cognitive words, and would refer to the self more often and to others less often from the first to the third writing sessions. In contrast, those who wrote about neutral events were expected to make fewer of these changes over the course of the writing sessions.

In contrast to the proposed hypotheses, there were no significant differences in mood, self-cognitions, and psychological symptomatology in the six weeks following writing exercises for those who wrote about negative or positive life events when compared to neutral events. There was also no evidence of a "delayed effect" in writing about negative life events, as mood, self-cognitions, and psychological functioning were unchanged or only slightly improved three months after writing about negative life events.

Despite the lack of evidence supporting the hypothesized improvements in mood, self-cognitions, and psychological symptomatology, results of the current study did support proposed hypotheses regarding the differential use of emotion words between groups. Specifically, those who wrote about negative life events used a higher percentage of negative emotion words (anxiety, anger, and sadness) when compared to those who wrote about positive or neutral life events. Furthermore, those who wrote about positive life events used a higher percentage of positive emotion words (positive feelings and optimism) when compared to those who wrote about negative or neutral life events. Thus, it appears as though those who wrote about negative and positive life events were more emotionally engaged overall than were those who wrote about neutral events. Moreover, the writing exercises apparently created the expected emotional experience within each writing condition. Thus, the writing exercises were experienced differentially, they just did not yield differential results.

Results are also largely supportive of hypotheses regarding the differential use of total words, cognitive words, and words related to self and others across writing conditions as well as changes in their use over time. Although the hypothesized differences in the overall number of words used by each group were not evident, those who wrote about negative and positive life events did write fewer words over time, as expected. As suggested by Pennebaker (1993), this may be indicative of a meaning-making process which involves integration and/or cohesion of a story as a result of repeated confrontation/telling. Alternatively, the use of fewer words over time may be reflective of less effort, a lower level of emotional investment in the writing exercises, fatigue, and/or boredom. Also partially consistent with the proposed hypotheses, the negative and positive writing groups used a higher percentage of cognitive words overall as well as an increased percentage of insight words over time when compared to the neutral writing group. This may be reflective of individuals' attempts to make sense of, or gain a better understanding of, significant life events.

Despite this change in use of insight words over time, however, those in the negative and positive writing groups did not exhibit the hypothesized increase in use of causal words over time. Also unexpected was the higher percentage of insight words used by those who wrote about negative life events when compared to those who wrote about positive life events. This is likely due to the fact that negative life events tend to shatter one's basic assumptions about the world and oneself (Janoff-Bulman, 1992) and that meaning-making activities, which includes gaining insight, are essential in the recovery from trauma (Goncalves, 1995; Neimeyer, 1994; Sewell, 1997). Thus, those who wrote about negative life events were more likely to expend high degrees of cognitive effort in making sense of negative life experiences. In contrast, those who wrote about positive life events may not have been as motivated to make sense or gain some sense of understanding of the event, thus using fewer insight-related words.

Further supporting the stated hypotheses, those who wrote about negative and positive life events used a greater percentage of third-person pronouns than did those who wrote about neutral events, suggesting a de-emphasis of the central role of the self in the telling of trauma stories by trauma survivors (Klein & Janoff-Bulman, 1996). Those who wrote about negative and positive life events also used an increasing percentage of first-person pronouns across time when compared to those who wrote about neutral events, again suggesting a greater degree of meaning-making activity and acceptance of some sense of control and/or responsibility in those who wrote about significant life events. Unexpectedly, however, those who wrote about negative life events also used a greater percentage of third-person pronouns when compared to those who wrote about positive life events. This may be related to the fundamental attribution error in which we tend to attribute our own negative life experiences to situational causes (outside forces) rather than dispositional causes (our own behavior; Baron & Byrne, 1987). As hypothesized, the use of third-person pronouns decreased over time for those who wrote about negative events. Interestingly, however, the increase in self-reference over time by those who wrote about positive events was not accompanied by the hypothesized decrease in reference to others over time.

In an effort to explain the differential outcome between the current study and those conducted by Pennebaker and colleagues, potential methodological differences were examined. Specifically, the current study was compared with past studies with regard to treatment dose, procedure, type of outcome measured, essay characteristics, and participant characteristics. Pennebaker and colleagues have varied the number of writing days (ranging from one to five writing days), the length of writing sessions (ranging from 10 to 20 minutes), the number of participants in the same room while completing the writing exercises (ranging from 1 to 72), and the type of outcome measured (physical health, psychological well-being, physiological functioning, and

general functioning). None of these variables has been found to be related to differences in outcome (Pennebaker & Francis, 1996; Smyth, 1998). The current study replicated Pennebaker and colleagues methodology as closely as possible, including the use of small groups of five participants each (although writing occurred while alone), three 15-minute writing sessions, and outcome measures related to psychological functioning (mood, self-cognitions, and psychological symptomatology). Thus, with regard to procedure, treatment dose, and type of outcome measured, the current study did not deviate from those conducted by Pennebaker and colleagues. The only obvious methodological difference involves the use of trauma survivors as participants in the current study.

In an effort to examine differences in essay characteristics, post-hoc analyses compared the use of content variables by those who wrote about negative life events in the current sample with the mean use of content variables across 20 studies of emotional expression of negative events studied by Pennebaker and colleagues (see Pennebaker & Francis, 1998). Although data regarding change in the use of content variables across writing sessions were not available for the 20 samples studied by Pennebaker and colleagues, results of these comparisons revealed significantly fewer total words,  $t(47) = -3.10$ ,  $p < .01$ , a significantly lower overall percentage of positive feeling words,  $t(47) = -2.06$ ,  $p < .05$  and a significantly higher overall percentage of references to others,  $t(47) = 2.73$ ,  $p < .01$  in the current sample when compared to the samples studied by Pennebaker and colleagues.

These results suggest several possible explanations for the lack of improvement in overall functioning exhibited by those who wrote about negative life events in the current sample. For example, it may be that the use of fewer total words and a lower percentage of positive feeling words by the current sample is reflective of less effort and/or a lower level of emotional engagement and/or investment in the writing

exercises. Alternatively, the use of fewer positive feeling words may be indicative of greater pessimism or other subtle differences in emotional processing. Finally, the current sample's tendency to make more frequent reference to others may be related to an unwillingness to take responsibility for negative life events and/or a sense that one has no control over negative events. As such, the occurrence of negative events may be attributed to the actions/behavior of others. According to Klein and Janoff-Bulman (1996), this de-emphasized central role of the self following exposure to trauma has been associated with poor outcome. In fact, a greater emphasis on others was the best predictor of poor present coping in their study of child abuse survivors.

An additional factor which may be contributing to the differences in long-term functioning between the current sample and those of previous studies involves the consistent, rather than increased, use of causal words over time by those who wrote about negative life events in the current sample. Pennebaker and colleagues (Pennebaker & Francis, 1996; Pennebaker et al., 1997) have hypothesized that the active construction of a narrative necessarily involves a dynamic process of changing thought patterns and that this change in thinking is crucial for recovery. In studying this hypothesis, they have found that an increased number of causal words from the first to the last day of writing is consistently related to improvements in long-term functioning. As such, the lack of change in the use of causal words (reflecting static thinking) by the current sample may have contributed to a lack of improvement in post-writing mood, self-cognitions, and psychological symptomatology.

A final consideration with regard to differences in outcome between those in the current study and those in previous studies who have benefited from the writing intervention involves differences in participant characteristics. In the past, this writing intervention has been associated with health benefits for students and other individuals who have experienced mild to moderate degrees of distress related to events such as

going away to college or losing one's job. In a study of PTSD patients, however, this writing intervention was associated with an increased number of health care visits and avoidance symptoms (Gidron, Peri, Connolly, & Shalev, 1996). In the current study, individuals were invited to participate only if they had experienced a severely traumatic event which "involved exposure to actual or threatened death or serious injury" or that "threatened to physically or psychologically shatter" the individual or someone close to the individual.

As discussed earlier, examination of pre-treatment measures of mood, self-cognitions, and psychological symptomatology revealed significant differences in emotional functioning between participants in the current sample and those who participated in normative studies as well as a study conducted by Pennebaker and colleagues (1990). Specifically, the current sample exhibited a greater degree of negative affectivity when compared with the general college student samples studied by Watson et al. (1988) and Pennebaker et al. (1990). In addition, fewer positive self-cognitions were endorsed by the current sample when compared to victim (of death of parent, death of sibling, incest, rape, fire, and accident) and nonvictim samples studied by Janoff-Bulman (1989). A greater number of negative self-cognitions were also observed in the current sample when compared with Hollon and Kendall's (1980) nondepressed undergraduates. Finally, a greater number of items related to anxiety, depression, somatic symptoms, and hostility were endorsed by those in the current study when compared to "employees" (type of work unknown) who participated in the normative study conducted by Kellner (1987). Thus, individuals in the current study evidenced significant levels of pre-treatment distress. Based on the findings by Gidron and colleagues (1996), this high level of distress may have been largely unresponsive to both the positive and negative writing interventions.

Although Greenberg and Stone (1992) and Wagner and Harter (1998) appear to have found long-term improvements in individuals who had experienced traumatic events, significant methodological differences between the current study and those conducted by Greenberg and Stone and Wagner and Harter may be largely responsible for the differential results. With regard to the study conducted by Greenberg and Stone, it is unclear whether the nature and severity of the trauma in their "severe" trauma group was comparable to that in the current study. Specifically, they did not select participants based on history of trauma, but instead sampled from a general undergraduate population. Following writing exercises, those who rated their trauma experience as a 6 or higher on a 7-point scale were placed within the "severe" trauma group.

Although the definition of a "severe" trauma in the Greenberg and Stone (1992) study appeared to be somewhat more stringent than that used in the current study (trauma rated 7 or higher on a 10-point scale), the stipulation in the current study that the event must have "involved exposure to actual or threatened death or serious injury" or that "threatened to physically or psychologically shatter" the individual or someone close to the individual implicates trauma of a more severe nature. Review of the narrative content categories within each study offers further support for this hypothesis. Specifically, those who participated in the Greenberg and Stone study wrote about topics related to actual or threatened death or serious injury/illness to the individual or someone close to the individual as their most traumatic experience 27% of the time, while all of the participants in the current study reported having experienced such events. Thus, it may be that those in the current study experienced more clinically significant levels of distress than did Greenberg and Stone's participants and that this high level of distress was less responsive to the negative writing intervention.

Those who participated in the study by Wagner and Harter (1998) experienced traumatic events of a similar nature and severity as those in the current study. However, a methodological difference between the current study and that conducted by Wagner and Harter involves the inclusion of a mood self-monitoring component by Wagner and Harter. Some self-monitoring activities can be related to negative outcomes (e.g., increased vigilance/anxiety). However, due to the long-term improvements in all groups studied by Wagner and Harter, including the control condition, this self-monitoring activity was thought to be enough to increase awareness of mood states, and subsequently reduce maladaptive negative moods while increasing positive moods and cognitions. The removal of the self-monitoring component and resulting lack of improvement in the current study suggests that the self-monitoring reactivity, rather than the writing experience per se, may have been largely responsible for the long-term improvements found by Wagner and Harter.

With regard to the narrative features which are associated with long-term improvements in mood, self-cognitions, and psychological functioning, it was hypothesized that those who improved most while writing about negative life events would use a greater percentage of positive and negative emotion words, with the number of negative emotion words being moderate, and an increase in the use of cognitive words over time when compared to those who improved to a lesser extent or not at all (Pennebaker & Francis, 1996; Pennebaker et al., 1997). Based on cognitive-behavioral theory (e.g., Beck, 1967; Ellis & Grieger, 1977; Lewinsohn et al., 1976), it was hypothesized that those who improved most while writing about positive life events would use a greater percentage of positive emotion and fewer negative emotion words, as well as a greater percentage of cognitive words, when compared to those in this group who improved to a lesser extent or not at all.

It was further hypothesized that those who improved most while writing about negative or positive life events would use a greater number of words overall, but evidence a more pronounced decrease in overall word use over time, when compared to those who improved to a lesser extent or not at all. Based on findings by Klein and Janoff-Bulman (1996), it was hypothesized that those who improved most while writing about negative or positive life events would use a greater percentage of first-person pronouns and fewer third-person pronouns overall when compared with those who improved to a lesser extent or not at all.

Although there was a statistically significant difference between the most improved and least improved (actually deteriorated) groups in terms of level of overall long-term functioning, none of the proposed hypotheses regarding narrative features which were thought to be associated with greater degrees of improvement in long-term mood, self-cognitions, and psychological functioning were supported. Statistical issues appear to be largely responsible for this outcome. First, the difference in level of long-term functioning between the most improved and deteriorated groups was likely attenuated by the overall lack of long-term improvement. In other words, level of improvement in the "most improved" group was minimal, as these were the individuals who improved most out of a sample that did not improve significantly. This very small difference in overall level of long-term improvement between individuals is evident in the restricted range of mean standard scores of change (- 0.63 to + 1.0). A second statistical issue involves a lack of statistical power. Specifically, tests of the relationship between condition, improvement status, and narrative content across writing sessions included sample sizes of less than 20. Furthermore, tests of the curvilinear relationship between negative emotion word use and the various outcome measures in those who improved most while writing about negative life events included a sample size of only 15.

A final consideration with regard to differences in the relationship between narrative content and greater degrees of improvement in those who participated in the current study and those who have participated in previous studies may again involve differences in initial level of distress. In the current study, participants were selected based on having experienced a severe trauma. Thus, when asked to write about their most traumatic experiences, many wrote about topics related to actual or threatened death or serious injury/illness to the individual or someone close to the individual. In previous studies of this sort, participants have been drawn from segments of the general population which, for the most part, has not experienced a severe trauma, and been asked to write about coming to college, job termination, or their most traumatic experiences. Given these differences in initial level of distress, it is possible that those narrative features which have been associated with health benefits in individuals who write about such events as adjustment to college and job termination are not the same features which are associated with improvements in mood, self-cognitions, and psychological symptomatology in individuals who have suffered a severe trauma.

Traumatic stress research has noted a distinction between memories for ordinary events and memories for traumatic events, in that traumatic memories seem immutable, and are more emotional and perceptual in nature (Terr, 1993; van der Kolk, Blitz, Burr, & Hartmann, 1984). Furthermore, traumatic memories are encoded differently and are not integrated into an existing personal construct or narrative (Christianson, 1992; van der Kolk, 1994). Thus, they are stored as sensory perceptions, obsessional ruminations, or behavioral reenactments (van der Kolk & van der Hart, 1989, 1991). Based on this research, it is conceivable that the narratives of trauma survivors in the current study differ in important ways from those of the more general population examined in previous studies of this sort. For example, those who have experienced a severe trauma may experience persistent intrusive and distressing symptoms,

avoidance, and/or hyperarousal that interferes with narrative construction. Thus, something other than cognitive processing may be reflected in their narratives, such as dissociation or separation from the event, emotional buffering, and/or a lack of integration between emotional and cognitive systems.

Although the Linguistic Inquiry Word Count (LIWC) program is an efficient first step in evaluating narrative data, it may not be sufficiently sensitive to capture the narrative features which are associated with greater degrees of improvement in those who have experienced a severe trauma. For example, in the current study, content category usage was often measured in fractions of a percent. Thus, the majority of narrative content is not being captured by the word count program. Furthermore, emotional categories in the LIWC program may be overly inclusive of global evaluative terms, that are less helpful in elaborating and defining emotional experience, and under-inclusive of more idiographic, specific emotional expressions. A previous study has found the LIWC program to be less sensitive, when compared with a clinical content coding system, to construct content related to long-term outcome of child sexual abuse (Harter, Erbes, & Hart, 1999). Furthermore, it has been suggested that trauma disrupts the accuracy and continuity of important life constructions (Gustafson, 1995; Harter, Alexander, & Neimeyer, 1988; Harter, Erbes, & Hart, 1998; Harter & Vanecek, *in press*; Neimeyer & Stewart, 1996; Polkinghorne, 1991; Sewell, 1996; Klein & Janoff-Bulman, 1996; White & Epston, 1990; Wigren, 1994). Narrative features which are reflective of inaccuracy or incontinuity in life construction, such as disorganization, lack of cohesion, and lack of temporal integration, are unlikely to be reflected in a word count program. Furthermore, word count programs fail to address the fragmentation of traumatic events from other aspects of experience as well as the fragmentation in the experience of the self that is described in the aftermath of trauma.

Thus, word count programs are less powerful than a more context sensitive analysis by skilled coders (Harter et al., 1999).

In an effort to examine narrative features associated with improvement in those who wrote about negative and positive events in the current sample, narratives written by the three participants who showed the most improvement and the three participants who showed the greatest degree of deterioration in each of the negative and positive writing groups were reviewed. Qualitative examination of these "case studies" revealed several features which were associated with greater and lesser degrees of improvement within each of the two writing conditions.

For those who wrote about negative life events, greater improvement was associated with an initial openness and honesty in disclosing the event, overt questioning about the event, an acknowledgment of the negative aspects of the event coupled with optimism about the future, an increase in the expression of thoughts and feelings about the event over time, a sense of resiliency and pride in surviving the event, and a move toward resolution of the event over the course of writing. These participants made statements such as "I don't think I'm over it, but am dealing with it the best I can," "I can never bring back the past...so I'm moving on slowly," and "I made it through it and have become a better person because of it." Furthermore, these narratives tended to be more organized, coherent, and richly developed over time.

In contrast, those within the negative writing condition who showed the greatest deterioration wrote narratives which were more factual in content (actively avoided emotional aspects of the event), included self-blame with regard to the event, reflected confusion about the event, and failed to move toward resolution of the event over the course of writing. Furthermore, these narratives tended to be more disorganized, included ideas that were contradictory, and described negative life events which were ongoing rather than discrete. These narratives included statements such as "I feel more

at ease yet [it is] still in the front of my mind on a day to day basis. I realize that complications could easily reoccur at any given moment. The fear of losing my mother is always foremost in my mind" and "It wasn't a painful divorce...it was for the best...as I write this I feel like crying...[the divorce] never really affected me negatively...sometimes I get so upset and often feel I can't deal with it."

For those who wrote about positive life events, greater improvement was associated with frequent expression of positive emotion (use of words such as excitement, love, beauty, magic, faith, luck), a sense of pride and resiliency (use of words such as reassurance, power, proud, confident, promise, secure), overt questioning about the event (which promotes cognitive processing), descriptions of sensory and/or visceral reactions to the event, and integration of the event into the individual's sense of self. Furthermore, these narratives became more organized, more coherent, and more fully developed over time. Ultimately, the event was described as life-changing and was valued for the role it played in the individual's development.

Interestingly, those within the positive writing group who deteriorated the most consistently wrote about events which were perceived by the author to be positive, but had very negative aspects (a football injury which prevented future play, high school graduation which led to loneliness in college and desire to be back in high school, and spending time with a loved one with whom the author no longer has a relationship). As such, the authors expressed much confusion and there was very little resolution of the events by the end of the writing intervention. These narratives were characterized by static (rather than dynamic) thinking, expression of mixed emotions (equal proportion of positive and negative words), more frequent reference to the past and a lack of vision for the future, and almost no reference to personal resources which may be employed to improve the situation. Furthermore, the narratives were disorganized and lacked cohesion.

In comparing these identified qualitative features with the quantitative LIWC scores obtained for these participants, it is clear that one is not a direct measure of, or even strongly correlated with, the other. In some cases, judgments made during qualitative examination often were not reflected in the quantitative LIWC measures. For example, qualitative examination suggested that those who improved most in the negative writing condition evidenced an increase in the expression of thoughts and feelings over time. However, quantitative LIWC scores for these participants are mixed with regard to the overall level of emotional and cognitive word use and changes in their use over time.

Some narrative features which were thought to contribute to improvement (or deterioration) in outcome through LIWC may actually be associated with a different outcome when used in certain contexts. For example, a high degree of self-reference (as measured by LIWC) was hypothesized to be associated with improvement in both experimental groups. However, in cases where self-reference is actually in the form of self-blame (identifiable through qualitative examination but not through LIWC), outcome was found to be poor. Similarly, narrative features which were thought to be associated with improvement (or deterioration) in outcome when used alone may be associated with a different outcome when used in combination with other narrative features. For example, a greater number of positive words and fewer negative words were hypothesized to be associated with long-term improvement in those who wrote about positive events. However, qualitative examination suggested that one individual who improved in this group actually used fewer positive feeling words and a greater number of anxiety-related words, but also used more words reflective of optimism and fewer words expressing anger. Thus, it seems that, when used in combination, the use of some words may serve as a "buffer" against the detrimental effects of others.

In conclusion, the qualitatively-determined narrative features which were associated with long-term improvements in mood, self-cognitions, and psychological functioning, whether they wrote about negative or positive life events, included an overt questioning of the event (promoting cognitive processes), the development of a sense of resiliency and pride from the experience, an understanding of the event and its value for the individual's future, and movement toward resolution or integration of the event into the individual's sense of self. Furthermore, narratives which are organized, coherent, and richly developed were associated with greater improvement. For the most part, these features cannot be captured with a word count program such as Pennebaker's LIWC. Rather, skilled coders may be required for context sensitive analyses.

In summary, this study contributes to the development of a paradigm for further testing the efficacy of narrative exercises in facilitating recovery from trauma. It suggests important issues, however, to be addressed in future research. Specifically, future studies may wish to include the provision of additional resources (i.e., coping skills training, self-monitoring of mood), as repeated written disclosure alone may not be a powerful enough intervention and/or may even have negative consequences in those who have experienced a severe trauma. It may also be interesting to examine the relationship between different types of trauma (e.g., normative vs. non-normative), and the relative acceptance of the traumatic event, and the use of meaning-making processes. In an effort to identify the narrative features which are important in trauma recovery, future research should also consider the use of skilled coders or other context sensitive methods of narrative analysis. Finally, future research should examine the effects of mood monitoring alone in an effort to determine the contribution of the self-monitoring component introduced to this paradigm by Wagner and Harter (1998). Narrative models of therapy are well positioned to help clients articulate, deconstruct,

and ultimately reconstruct the debilitating and oppressive stories of their lives.

However, it seems that there is much to be done before this intervention can be used clinically.

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## APPENDIX A

### EXTENDED LITERATURE REVIEW

#### A Meaning-Making Understanding of Psychology

It has been proposed that we, as humans, are meaning-making beings (e.g., Dean, 1989; Goncalves, 1995; Hermans, 1995; Kelly, 1955; Parry, 1997); we are driven to understand the world around us and are motivated to make meaning out of our experiences in an effort to predict and explain future events (Pennebaker, 1997). In fact, a fundamental assumption about the nature of human beings is that we are essentially interpretive, always in the process of assigning meaning to our ongoing experiences (Kelly, 1955). Referring to persons as "scientists," Kelly described humans as continually formulating, testing, and revising personal theories in an effort to make sense of experiences and to anticipate future events. Toward a similar end, Dean suggested that language is, by nature, an imprecise and transparent way of communicating meaning and, thus, demands that the listener actively engage in meaning-making activities in order to make sense of experiences. However, meaning does not exist apart from its linguistic context and the act of communication. Thus, it has been suggested that language is involved in both the creation and conveyance of meaning (Terrell & Lyddon, 1996).

Because the telling of stories tends to promote self-understanding and is a powerful tool for discovering meaning, humans often attempt to understand, gain control over, and make sense of experiences through the development of stories or narratives (J. S. Bruner, 1986; Goncalves, 1994; McLeod & Balamoutsou, 1996; Russell & Wandrei, 1996). Polkinghorne (1991) suggested that "narrative is the cognitive process that gives meaning to temporal events by identifying them as parts of a plot" (p. 136). Furthermore, narrative "emphasizes order and sequence" (E. Bruner,

1986) and "is constructed and embodies an active protagonist" (McLeod, 1996). Thus, emplotment (the activity of narrative construction) involves "the transformation of isolated or independent events into meaningful stories that provide coherence and continuity to an individual's experience of self and world" (Terrell & Lyddon, 1996, p. 27). It represents the basic means by which life experiences are organized meaningfully over time (J. S. Bruner, 1986; Polkinghorne, 1988, 1991; Sarbin, 1986). For some, the narrative is equivalent to the self (Crites, 1986), for others it is simply the means through which individuals understand their lives (Howard, 1991). For Russell and Wandrei, narratives are the primary means by which we build representations of the past, relate information in the present, and anticipate the future.

Because narrative activity is a primary means by which humans convey purpose, intention, and direction in their lives, it is regarded as helpful for understanding our own behavior as well as that of others (Polkinghorne, 1988). Parry (1997) suggested that we come to understand ourselves through the stories that we tell ourselves about ourselves and the world and the stories we come to believe of what others tell us about ourselves and the world. Thus, we become the stories we tell ourselves, believe them as truth (Doty, 1975; Parry, 1997), and consistently interpret events in such a way as to confirm and protect this image we have come to believe is ourselves. Moreover, we defend the image of the world created through our stories because it upholds our identity. Thus, our life stories are the interpretive filters through which we see ourselves and the world (Mair, 1988; Parry, 1997). According to Mair, we do not know the world other than as a story world. This idea that people make sense of and relate their experiences through stories, that we live in a 'storied world,' has become increasingly influential within the social sciences. In fact, narratives are increasingly being viewed as a rich domain for studying human experience and understanding.

According to the role-theory conceptualization of narratives (McCall & Simmons, 1978), an individual who assumes a role either constructs a story that relates to his or her preexisting sense of self or adopts a more generic narrative that organizes and attributes significance to life events (Atkinson, 1995). In accordance with this perspective, the self (consisting of the individual's awareness of his or her identity, continuity, and self-image) emerges as the individual repeatedly, progressively, and successively employs roles through narratives (Neimeyer & Stewart, 1996). An individual may assume many possible selves and construct a myriad of narratives. These selves are thought to be maintained to the extent that the role is available and the narrative assists the individual in understanding and fulfilling the role requirements (Neimeyer & Stewart, 1996). Although some narratives are specific to the various roles adopted by an individual, a primary narrative coordinates the meaning-making activities of these component selves (Neimeyer & Stewart, 1996).

Described as "a psychology of personal meanings," the epistemological framework of constructivism has been advanced as the foundation supporting the development of a narrative approach to the human sciences (Howard, 1991; Lyddon, 1995). Regarded as a forerunner of constructivism, Kelly (1955) asserted that person theories are comprised of bipolar contrasts, referred to as personal constructs. This construct system provides contrasting alternatives through which an individual anticipates, explains, and engages in life. For Kelly, "the crucial differences between two people have less to do with the disparate events they have encountered than with the unique constructions they place upon these events" (p. 55). Although language is important for the construction of experiences and the testing, revision, and communication of those constructions, Kelly asserted that personal constructs are not necessarily verbal or intellectual, but may be emotional, behavioral, or even physiological.

Personal construct theory describes certain basic activities as inherent in humans. Chief among these is abstraction of regularly occurring patterns in the world around us in order to anticipate events. Specifically, when confronted with various experiences, an individual "attunes his ear to recurrent themes" and attempts to "phrase his experience in order to make sense of it." According to Kelly, it is through this process that humans "discover the bases for likenesses and differences" (Kelly, 1955, p. 52). But, as Kelly realized, "the successive revelation of events invites the person to place new constructions upon them whenever something unexpected happens. Otherwise one's anticipations would become less and less realistic" (Kelly, 1955). Kelly's recognition of a progressive, evolutionary quality of our construing is apparent in the axiom that "a person's construction system varies as he successively construes the replications of events" (Kelly, 1955, p. 72).

Any given behavioral experiment conducted by an individual helps elaborate the system of meaning through which he/she lives. Although personal construct theory highlights the capacity of personal systems of meaning to change across time, this change typically takes the form of systematic evolution rather than random variation. Thus, the processes of change are themselves patterned in that construct systems evolve to encompass new experiences, but only within the constraints imposed by one's current constructions (Kelly, 1955). Furthermore, changes that are incompatible with these core beliefs tend to be resisted.

It has been asserted that many features of constructivism are similar to narrative conceptualizations of human knowledge (Terrell & Lyddon, 1996). Perhaps the most characteristic feature of constructivist theory is its belief that all cognitive phenomena involve active and proactive processes (Goncalves, 1995). For example, Weimer (1977), contended that the mind is an active, constructive system, rather than merely a passive repository for knowledge. Based on this perspective, humans actively

participate in their environments through feedforward mechanisms which allow them to anticipate and prepare for events in advance of their occurrence (Mahoney, 1991). Similarly, feedforward processes are thought to be central to the development of narratives and ultimately influence how one moves through life. For example, Sarbin (1986) asserted that narrative provides an informative function in that human beings "think, perceive, imagine, and make moral choices according to narrative structures" imposed upon life experiences (p. 8). Furthermore, the telling of stories creates meaning which greatly influences future understandings. In fact, Polkinghorne (1988) suggested that narrative is a pervasive means by which we make sense of cultural and social environments and, thus, is fundamental to comprehension.

A second feature of constructivism that is related to narrative is the relativistic and contextual nature of reality (Terrell & Lyddon, 1996). An important implication of this model is that meaning changes with its context. That is, knowledge, from a constructivist perspective, is socially constructed in the context of human relationships. Narrative writers similarly point out that "our culturally adapted way of life depends upon our shared meanings and shared concepts and depends as well upon shared modes of discourse for negotiating differences in meaning and interpretation" (Bruner, 1990, p. 13). Furthermore, specific events may have different or even contrasting meanings over the course of time (Hermans, 1995). This view underscores the relativistic stance. In essence, narrative discourse can be viewed as a fundamental tool for organizing features of human experience into a recognizable whole, with the meaning attributed to a given event subject to change based on the particular narrative slant used.

### Meaning-Making Conceptualizations of Trauma

Personal construct psychologists have described trauma as "an experience that massively invalidates or disrupts the basic processes or assumptions through which we

participate in life" (Harter & Neimeyer, 1995). Traumatic events have traditionally been defined as those which threaten our physical integrity (APA, 1994). However, as suggested by Harter and Neimeyer, events which "threaten our core psychological integrity by disrupting our most core relationships, including our construction of our self," may be equally as traumatic (p. 254).

According to Janoff-Bulman (1992), traumatic experiences result in significant disruption to our basic assumptions about the world and ourselves. Among such basic assumptions, Janoff-Bulman describes beliefs that the world is meaningful (defined in terms of justice, controllability, and chance), others are benevolent (generally supportive and well-intentioned), and the self is worthy (defined by self-evaluations, belief that one can control outcomes, and luck). According to Janoff-Bulman, when an individual experiences a trauma, their assumptive world becomes shattered. "They can no longer assume that the world is meaningful or what happens makes sense. They can no longer assume that they have control over negative outcomes or will reap benefits because they are good people" (p. 62). Thus, the traumatized person may assume that the world is threatening, others are malevolent, and the self is unworthy.

As discussed by Harter and Neimeyer (1995), several other clinical theorists have begun to develop models of trauma and loss that have similar features to those described by Janoff-Bulman (1992). For example, Taylor (1983) has focused on cognitive adaptation of individuals to threatening events, particularly with regard to a search for meaning in the experience and an attempt to re-establish some form of positive self-regard. Similarly, Viney (1991), describes the "dislocative" processes in which individuals engage when their core constructs are invalidated or threatened as well as an individual's attempts to assimilate and accommodate events in anticipation of future events. Finally, Horowitz (1986) focuses on the cognitive processing of severe stress and the integration of traumatic memories into a revised sense of self. Each of

these theorists attempts to characterize the relationship between trauma and its disruption to the assumptive world of the survivor.

Adopting a role-theoretic narrative approach, Neimeyer and Stewart (1996) have developed a model of posttraumatic stress which contends that traumatization disrupts the individual's ability to maintain a meaningful story of her/his identity and relation to the world. Thus, "the traumatic experience not only disrupts or damages the victim's narrative stream of consciousness, but may also fundamentally challenge the unity of the victim's selfhood" (p. 362). According to Neimeyer and Stewart, an individual who experiences a trauma adopts one or more new roles (selves). Because these new selves are not able to be developed in the usual way that one elaborates a role, a new trauma narrative and a new trauma self are constructed that create a "traumatic world" for the victim. This newly constructed "traumatic world" is usually too disparate from the primary narrative to be seen as part of the same story (person). The trauma self then constricts the other possible selves and the extent to which they can operate effectively, leading the individual to experience fragmentation and an incapacitation of the "self as storyteller" (p. 361).

In the past several years, Sewell and colleagues have been working to build and test a constructive model of posttraumatic stress. In the original model, three alternatives were proposed for experiences which were outside of the individual's conceptual system. First, consistent with Kelly's (1955) notion of anxiety, the model proposes that the individual can experience "constructive bankruptcy" when faced with a situation in which there are no dimensions of meaning available to the person that allow him/her to place the experience into perspective with other life experiences. Second, the individual might achieve "dissociated" construction, in which one or more constructs are created to preemptively construe the trauma, with some or all of the

traumatic experience. These first two constructive alternatives following a traumatic experience were hypothesized to account for the symptoms of PTSD.

The third constructive alternative following traumatization is construct elaboration. The process of elaboration involves forming a network of constructions, such that the individual can both anticipate and understand experiences which are outside his/her conceptual system. If the individual is easily able to make adjustments to the overall construct system and rapidly accommodate the experience, then there is (in the subjective sense) no traumatization. If constructive bankruptcy and/or dissociation ensue while attempting to make sense of the experience, however, a posttraumatic stress reaction or PTSD will result (Sewell, 1997).

### Influence of Trauma on Narrative Construction

Although narrative descriptions of life have proven attractive to psychological audiences (Terrell & Lyddon, 1996; White & Epston, 1990), narrative descriptions of the way problems in living arise and endure are somewhat lacking (Neimeyer & Stewart, 1996). For instance, Gustafson (1995) maintains that problems in life are characterized by gaps in an individual's life story. For White and Epston, problems arise when narratives no longer reflect lived experiences. Wigren (1994) contends that problems result when narratives are incomplete either because a narrative has not been developed or because it has been interrupted or otherwise prevented from functioning in its usual way. Finally, Polkinghorne (1991) asserts that narratives "decompose" or "disintegrate" when they become unable to emplot or integrate new or forgotten experiences. Although these explanations describe the relationship between a malfunctioning narrative and an individual's inability to meaningfully construe experiences, Neimeyer and Stewart imply that these accounts are overly simplified and under-developed.

According to Neimeyer and Stewart (1996), a role-theoretic conceptualization of narratives contends that an individual who experiences a particular event as traumatic develops the role of victim, mourner, injured, survivor, etc. in the context of that experience. The traumatized individual is then assigned one or more of these roles without any opportunity to develop the role in the usual way, that is, by successively generating narratives for the role and the plot (Neimeyer & Stewart, 1996). Thus, a new narrative (trauma narrative) and self (traumatized self) emerge. This role and narrative create a "traumatic world" for the individual. As such, the traumatic self differs from the other selves in that it was created with psychological processes that operated while the individual was involved in the victim role. The traumatic self thereafter operates in a psychologically consistent way with the processes that existed at the time that self was created (Neimeyer & Stewart, 1996).

According to this perspective, the traumatic self constrains the other possible selves. That is, as long as the traumatic self exists in its original form, the cognitive, perceptual, and emotional processes activated during its creation restrict the psychological processes available to the premorbid selves (Neimeyer & Stewart, 1996). Thus, the meaning-making processes of the former selves become more like those of the traumatic self. As such, a trauma survivor may feel as if "I'm not the person I once was" (Neimeyer & Stewart, 1996).

The traumatized person therefore adopts a traumatic narrative that, by definition, is very different from the primary, coordinating story. The traumatic narrative is "written" very differently than was the premorbid, primary life story. This narrative may be created with memories of sights, sounds, smells, and feelings associated with the traumatic event. It may also implicate new rules for how to relate to others who were involved in the trauma. Neimeyer and Stewart (1996) suggest that this narrative is "problematic because, unlike all other narratives in the victim's

repertoire, the trauma narrative is not elaborated or developed actively and deliberately by the person at the time of the trauma" (p. 363). Taking on familiar roles with these constrained narratives often creates a potent sense of loss of former selves; the individual often feels as though some part of him/her was left behind in the events surrounding the trauma (Neimeyer & Stewart, 1996).

In an effort to empirically test the proposed theories regarding the effects of trauma on meaning-making activity, researchers have begun to examine the personal constructs of trauma survivors using Repertory Grid and, to a lesser extent, autobiographical narratives. Repertory Grid studies which have focused on the effects of child sexual abuse on personal constructs have found that survivors tend to perceive themselves as different from both their "ideal self" and from important others (Harter, Alexander, & Neimeyer, 1988). Furthermore, child sexual abuse survivors have been found to use fewer constructs relating to affect and more constructs relating to relatively superficial aspects of others, such as physical appearance (Harter, Erbes, & Hart, 1998). Finally, survivors of physical, emotional, and sexual abuse have been found to report more negative views about the self on a self-report questionnaire than do those who have not been abused (Harter & Vanecek, *in press*).

In an early study of their personal construct model of PTSD, Sewell and colleagues (1996) used a life events repertory grid to examine the extent of elaboration of trauma-related constructs in combat veterans with and without PTSD. The results of this study indicated that PTSD was associated with lower elaboration of the trauma-related constructs as well as more black-and-white thinking when compared with controls. In a study of traumatized individuals who had survived a mass shooting (Sewell, 1996), those witnesses and survivors who had failed to recover from posttraumatic stress symptoms within three months also showed less elaboration of the traumatic event construction when compared with those who did recover. In both

studies, those with PTSD more frequently generated negative, rather than positive, construct poles.

In a study which looked at the narrative features of child abuse survivors' life stories, Klein and Janoff-Bulman (1996) examined the relative emphasis on the past versus present and future and on the self versus others in respondents' stories. In this study, the narratives of child abuse survivors differed from those of nonvictimized respondents in that the survivors' stories focused more on the past and de-emphasized the central role of the self. Interestingly, greater emphasis on others was the best predictor of poor present coping among survivors.

### A Meaning-Making Approach to Psychotherapy

From the description of psychoanalysis as the "talking cure," to the development by Robert Hobson of a "conversational" model of therapy, it has been recognized that the process of psychotherapy is one that relies on the telling of stories. However, Spence (1982) argues that the aim of psychoanalysis and other forms of psychotherapy is not the discovery of "historical" truth, but the creation of "narrative" truth. In other words, it is not the uncovering of actual events which may have caused the disruption that is critical, but the construction of an account of events that is coherent and allows the client to live a satisfying life (McLeod, 1996).

It is assumed that lack of well-being is associated with life-stories or self-stories which are incomplete, confused, or have negative or tragic outcomes (Hermans, 1995; Neimeyer, 1995; Neimeyer & Stewart, 1996; Terrell & Lyddon, 1996). In fact, individuals often seek therapy at points when their life stories become ineffective, thereby requiring editing, elaboration, or major "rebiographing." From a personal construct perspective, therapists collaborate with clients in an effort to create new endings for the client's personal stories (Howard, 1991; McLeod, 1996; Terrell &

Lyddon, 1996). However, in a meaning-making approach to psychotherapy, the troubled life story that an individual brings into therapy is not abandoned or destroyed, but must be accepted and transcended. In other words, "the new narrative must be one that not only subsumes the old story but explains why it was necessary in the first place" (McLeod, 1996, p. 181).

According to Neimeyer (1994, 1995), one function of client-generated narratives is the organization and reorganization of the client's sense of self which aids in the goal of establishing meaning, coherence, and continuity in the client's lived experience. For others, the creation of a self-narrative enables clients to gain an understanding of who they are (Russell & Wandrei, 1996) while at the same time allowing them to project their own understanding of themselves and their world (Goncalves, 1995). According to Rennie (1994), the creation of a self-narrative provides emotional relief, stimulates contact with the inner disturbance, and serves as a medium for productive thinking carried out privately. For Goncalves, several important cognitive functions are accomplished in the process of telling a life story. Specifically, autobiographical telling is thought to help one address tension associated with past events, re-experience and understand real feelings, ventilate these feelings, generate ideas that could contribute to self-understanding, develop a sense of control, and examine the operation of private processes.

In addition to enabling the client to experience and understand his/her life story differently, several researchers have suggested that the development of a more coherent narrative facilitates a change in the self as well as the adoption of novel strategies with which to confront the future. For example, Goncalves (1995) suggests that we change by changing the nature of our writing and by trying out new projects or new ways of understanding. Similarly, Terrell and Lyddon (1996) contend that retelling the stories of one's life serves as an important means for reauthoring and changing that self.

Finally, Mair (1988) asserts that the creation of a challenging alternative story is the vital beginning from which new experiencing may become possible.

Several features have been identified as essential to the re-construction of a personal life story in recovery from trauma. For Janoff-Bulman (1992), recovery is dependent upon regaining some, possibly less absolute, positive versions of these shared basic assumptions. Recovery, according to Neimeyer and Stewart (1996), is contingent upon elaboration of the trauma complex (the event, the role, the world) as well as reflection and integration of the newly composed narratives with the primary narrative and its associated self. Likewise, Sewell (1997) suggests that recovery is contingent upon the development of trauma-related constructs that can be integrated into the construct system as a whole as well as the successful integration of the isolated construct subsystem into the entire construct system. Furthermore, Sewell implies that construct re-alignment, consisting of loosening, reassignment, and tightening of constructs, is essential.

When first uttered in the therapeutic dialogue or in other formats, such as a personal journal, Neimeyer (1994) warns that these attempts at meaning-making may be vague, intense, fragmentary, or apparently incoherent. However, if such narrative exploration is nurtured rather than suppressed, Neimeyer suggests that the narratives often become important in carrying the client toward self-development. For Neimeyer (1995), the content of the narrative is secondary to the act of authoring, as the act of writing is thought to help one achieve a greater sense of authorship of one's own life. Similarly, for Parry (1997) the central goal of narrative therapy is "the facilitation of a sense of personal authorship or agency concerning the events of one's life" (p. 122). According to Parry, once a client is able to realize that his/her life is less a matter of things happening to the client and more a matter of him/her authoring the things that happen, the closer the client will be to becoming an artist in his/her own life.

### Narrative Therapy and Recovery from Trauma

Although several theorists and clinicians have described the narrative processes which are thought to be conducive to trauma recovery, there has been an absence of systematic research into the nature of these essential elements. However, research from a broader social-cognitive perspective, namely those studies conducted by Pennebaker and colleagues, provides valuable information regarding the emotional and cognitive features which may be conducive to recovery from trauma.

Studies which have looked at the use of narratives in recovery from trauma have consistently found that simple affective discharge is not a sufficient condition for therapeutic change (Murray, 1985; Nicholas & Zax, 1977). Rather, emotional expression is thought to facilitate cognitive changes which then alter emotional experience, thereby leading to more adaptive behavior (Greenberg & Safran, 1987; Murray, Lamnin, & Carver, 1989; Nichols & Efran, 1985). Specifically, early investigations which looked at various components of psychotherapy suggested that effective psychotherapy is characterized by cognitive change which results in a shift from negative to more positive feelings (Greenberg & Safran, 1987). So, too, Nichols and Efran suggested that "true catharsis" involves a progression from negative feelings to a form of cognitive release and, finally, to recovery. Results of these early studies led researchers to conclude that therapeutic resolution involves three basic processes: the expression of negative feelings, cognitive reappraisal, and a shift to positive feelings.

In recent years, a number of investigators have begun to point to the critical role of cognitive changes that are brought about by writing. In two studies by Murray and his colleagues (Donnelly & Murray, 1991; Murray et al., 1989), students either wrote or talked to a therapist about a traumatic event or about superficial topics. In addition to greater emotional expression in the two trauma conditions, subjects who wrote or

talked about upheavals evidenced greater cognitive changes across the four-day study. Cognitive change was measured by judges who evaluated transcripts on the degree to which they exhibited better understanding of the problem and awareness of alternative explanations for the upheavals.

Further investigation of this position has involved the analysis of both cognitive and emotional changes in therapy and writing sessions. Murray et al. (1989) discovered that the mere discussion of stressful events with an accompanying temporary arousal of negative affect in written essays is a necessary but not sufficient condition for the cognitive reappraisal to occur. Instead, therapeutic resolution required the shift from negative to positive feelings and a "basic change in attitude." In a study conducted by Donnelly and Murray (1991), the expression of both positive and negative emotions, seen in both their writing and therapy groups, was related to positive outcomes on a post-experimental questionnaire which surveyed general mood, thinking patterns, and behavior. Thus, both psychotherapy and written expression were effective in the emotional resolution of stressful and traumatic events. In both conditions, changes in thinking about the events and about the self played a central role in such resolution.

In testing his cognitive change hypothesis, Pennebaker has focused on the words used in describing traumatic events as indicators of emotional and cognitive processing of the event. In an attempt to analyze the language that individuals use in writing about emotional topics, the first strategy used by Pennebaker and colleagues involved the use of independent raters to evaluate the essays' overall contents to see if it was possible to predict who would benefit most from writing. Judges involved in this study noted that the essays of people who benefited from writing appeared to be "smarter," "more thoughtful," and "more emotional" (as described in Pennebaker, 1993, 1997). However, the relatively poor interrater reliability led Pennebaker and colleagues to

develop a computerized text-analysis program (LIWC: Linguistic Inquiry and Word Count).

The initial study using LIWC examined word use in general (e.g., use of negative and positive emotion words, insight words, causal words, number of words, percentage of unique words) as well as changes in word use over time in those who wrote about trauma (Pennebaker, 1993). In this study, those whose health improved most tended to use a higher proportion of negative emotion words than positive emotion words, with the greatest improvements being associated with the expression of anxiety and sadness. Furthermore, the increasing use of insight and causal words over successive writing days was linked to health improvement. As a crude measure of psychological coherence, Pennebaker looked at changes in use of unique words (the actual number of different words that a person uses in a single essay divided by the total number of words). Those who improved evidenced a significant drop in unique words over time when compared to those who did not improve. Thus, the building of a coherent story together with the expression of negative emotions appeared to be essential in therapeutic writing. Results of this study also indicated that the active development of a narrative is far more predictive of health than having a coherent story per se.

In a more recent study examining students' emotions surrounding starting college, Pennebaker and Francis (1996) were able to replicate the finding that increased use of insight-related and causal words from the first to the last day of writing led to improved health. However, the results of the emotional language analyses were largely unexpected. In contrast to the results of the previous, cruder analyses (Pennebaker, 1993), use of negative emotion words in this study was unrelated to long-term health changes. In fact, the results of this study suggested that improved physical health was associated with increased use of positive emotion words.

Analyzing narrative data with LIWC from 6 samples, Pennebaker and colleagues (1997) found that increased use of insight and causal words across writing or interview disclosure sessions related to a variety of health and other life outcomes, but not to psychological distress. Findings were less consistent with regard to increased use of emotion words, and again contrary to expectations, suggested increasing negative emotion words were related to more negative outcomes. In contrast, use of positive emotion words was again related to more positive outcomes. Attempts to crossvalidate these findings with a sample of partners of men who died with AIDS also suggested that increased use of insight and causal words between interviews predicted well-being and reduced post-traumatic symptoms. Changes in use of emotion words had little relation to the outcome of bereavement. Also surprisingly, across 7 studies, neither cognitive nor emotional word use was related to emotional distress. However, the measure of emotional distress used was a brief self-report measure of clinical depression that may not reflect the full range of symptoms that occur following traumatic events.

Combining data from several writing studies, Pennebaker and colleagues have found three linguistic factors which reliably predicted improved physical health (Pennebaker, 1997). First, the more that individuals used positive emotion words, the better their subsequent health. Second, a moderate number of negative emotion words predicted health; both very high and very low levels of negative emotion words correlated with poorer health. Third, and most important, an increase in both causal and insight words over the course of writing was strongly associated with improved health (Pennebaker, Mayne, & Francis, 1997). Interestingly, the actual level of word use for these categories was not important. Rather, those who improved went from using very few cognitive words on the first day of writing to a much higher level on the last day of writing. In other words, those who benefited from writing were

constructing stories. On the first day of writing, they simply described the traumatic experience, often out of sequence and disorganized. But, with each successive writing day the story became more coherent with a clear beginning, middle, and end. Ironically, participants who started with a clear, coherent, and well-organized story rarely evidenced any health improvements.

Although the Linguistic Inquiry Word Count (LIWC) program is an efficient first step in evaluating narrative data, it provides only limited, and in some respects crude data regarding the narrative features which are associated with improved functioning in trauma survivors. In fact, a previous study has found the LIWC program to be less sensitive, when compared with a clinical content coding system, to construct content related to long-term outcome of child sexual abuse (Harter, Erbes, & Hart, 1999). Recognizing that nomothetical, quantitative methods lose much of the passion and horror of case material presented by trauma survivors, more context sensitive systems for coding information processing strategies have been devised.

One such strategy involves the use of skilled coders in the study of integrative complexity. Complexity refers the degree to which spoken or written material demonstrates a search for and monitoring of information, attempts to predict outcomes and reactions, flexibly weighs options, and considers a number of alternative strategies. The components of integrative complexity are differentiation which refers to the recognition of more than one dimension of, or legitimate perspective on, an issue, and integration which refers to the relationship among these differentiated dimensions or perspectives (Baker-Brown et al., 1992; Schroder, Driver, & Streufert, 1967; Suedfeld & Pennebaker, 1997). Higher complexity indicates the individual recognizes the validity, relevance, or legitimacy of diverse approaches to an issue and also recognizes that solutions may be based on a consideration of how these diverse approaches can be compared or combined. Furthermore, an individual who demonstrates higher levels of

complexity has invested more resources - time, attention, mental effort, information search and processing, careful thought- in understanding the situation and in drawing conclusions or making decisions about it. Skilled coders assign a score of 1 (passage reveals neither integration or differentiation) to 7 (use of multilevel integration) to each scorable unit (usually a paragraph).

Research has shown that level of integrative complexity is influenced by ideology and values (Suedfeld, Bluck, Loewen, & Elkins, 1994) as well as stable personality predispositions (Schroder et al., 1967). Similarly, the need to cope with personal life crises results in increased complexity, at least among male subjects (Suedfeld & Bluck, 1993). These and similar findings have led to the formulation of two hypotheses, which are somewhat analogous to Selye's (1956) General Adaptation Syndrome stages of resistance and exhaustion when coping with stress. First, the cognitive manager hypothesis proposes that different levels of complexity indicate how much cognitive effort the individual has decided to invest (or is capable of investing) in the particular problem or situation being confronted. Second, the disruptive stress hypothesis proposes that when a situation becomes severely stressful, or continues for too long, cognitive resources for complex strategies become depleted and complexity decreases.

In an examination of these hypotheses, Suedfeld and Pennebaker (1997) examined whether the recall of very unpleasant memories would occur at a different level of complexity from that of neutral memories, and whether differences in complexity would be related to health outcomes in college students. Results indicated that essays about negative life experiences were significantly higher in complexity than were those about trivial topics. Furthermore, the level of complexity for those who wrote about negative events was correlated with health improvements. Specifically, moderate complexity, rather than maximal complexity, was associated with health

improvement. Based on these results, Suedfeld and Pennebaker hypothesized that an optimal cognitive manager allocated enough resources to analyze and come to terms with the memories of severely negative experiences, but that an excessive focus on this topic becomes counterproductive. In other words, it may be that the highest levels of complexity were reflective of brooding, obsessive rumination about the event, or an attempt to process an unnecessarily large amount of information when recalling the experience.

In an attempt to explore the cognitive processes of Holocaust survivors, Suedfeld, Fell, and Krell (1998) also chose to look at integrative complexity as it is, in their eyes, a measure of information processing that is "applicable to almost any connected verbal material, does not depend on linguistic style, and relates to the structure of thought, rather than merely the content" (pp. 324-325). In this study, memories showed decreased differentiation and integration as individuals moved from pre-war life to the shock and upheaval of organized persecution. High complexity levels reflected survivors mustering their resources to enhance their chances of survival and successful postwar adaptation.

These findings demonstrate the utility of quantitative, objective content analytic methods in narrative research. Unlike word-count programs such as the LIWC, methods which employ skilled coders have the potential to provide a more thorough understanding of cognitive dimensions in the study of survival during and after significant life events. In an effort to uncover additional components related to psychological and cognitive processes in trauma survivors, greater efforts should be made to employ skilled coders and/or to qualitatively examine narrative content.

## APPENDIX B

### TRAUMA SURVEY (TS)

We are interested in any traumatic events or extremely upsetting or confusing events that you have encountered at any time in your life. This includes events that involved exposure to actual or threatened death or serious injury or that threatened to shatter you or someone close to you, physically or psychologically.

Please check any relevant events. Indicate when they occurred and the degree of trauma you experienced:

(Check all that apply)	Your age when it occurred	How traumatic was it for <u>you</u> ? (0=not at all, 10=extremely)
____ Sexual abuse	_____	_____
____ Verbal abuse	_____	_____
____ Emotional abuse (other than verbal)	_____	_____
____ Physical abuse	_____	_____
____ Physical assault	_____	_____
____ Victim of armed robbery	_____	_____
____ Sexual assault not listed previously	_____	_____
____ Serious life-threatening or chronic illness or injury	_____	_____
____ Losing home in a fire	_____	_____
____ Loss of or damage to home in a natural disaster	_____	_____
____ Injury to self or family in a natural disaster	_____	_____
____ Witnessing crimes of violence	_____	_____
____ Participating in violent crimes	_____	_____
____ Witnessing violent destruction due to natural causes	_____	_____
____ Witnessing violence due to war	_____	_____
____ Participating in combat	_____	_____
____ Being in a war zone	_____	_____
____ Witnessing the violent death of a family member or close friend	_____	_____
____ Murder of a family member or close friend	_____	_____
____ Death by sudden illness of a family member or close friend	_____	_____
____ Death of a family member or close friend by accident	_____	_____

TS

(Check all  
that apply)

Your age when it occurred      How traumatic was it for you?  
(0=not at all, 10=extremely)

- Injury by violence of a family member or close friend           

           Injury by accident of a family member or close friend           

           Life-threatening or serious chronic illness in a family member or close friend.           

           Loss of a parent by death           

           Other loss or prolonged absence of a parent           

           Divorce of parents           

           Death of your child           

           Loss of spouse or long term intimate relationship by death           

           Loss of spouse or long term intimate relationship by divorce, etc.           

           other (describe):

Have you ever received psychological treatment or counseling related to traumatic events?  yes  no

**What is your current age?** \_\_\_\_\_