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Implications of Tailoring Emotional Expression within an Expressive Writing Paradigm

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LOMA LINDA UNIVERSITY
School of Behavioral Health
in conjunction with the
Faculty of Graduate Studies

Implications of Tailoring Emotional Expression within an Expressive
Writing Paradigm

by

Eric R. Hanson

A Dissertation submitted in partial satisfaction of
the requirements for the degree of
Doctor of Philosophy in Clinical Psychology

September 2013

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Each person whose signature appears below certifies that this dissertation in his/her opinion is adequate, in scope and quality, as a dissertation for the degree Doctor of Philosophy.

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ABBREVIATIONS

BEQ	Berkeley Expressivity Questionnaire
CECS	Courtauld Emotional Control Scale
EEQ	Essay Evaluation Questionnaire
LIWC	Linguistic Inquiry and Word Count
OQ-45	Outcome Questionnaire 45.2
PCL	PTSD Checklist
PILL	Pennebaker Inventory of Limbic Languidness
PTSD	Posttraumatic Stress Disorder
SAM	Self-Assessment Manikin

ABSTRACT OF THE DISSERTATION

Implications of Tailoring Emotional Expression within an Expressive Writing Paradigm

by

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Loma Linda University, May 2013

Dr. Jason E. Owen, Chairperson

This dissertation uses the theoretical perspective that both emotion and emotional processing theories could greatly enhance feedback messages given in a linguistic writing paradigm. The measurement of emotional expression is briefly reviewed along with the basic expressive writing paradigm, outcome of this expressive writing paradigm, and the tailoring literature. Reference is made to the single study (Owen, et al., 2011), which has utilized tailoring in an expressive writing paradigm; the present study is a modification of this original study. This dissertation used clinically minded feedback which utilized both emotion and emotional processing theory. For the experimental design, three tailoring conditions (linguistic tailoring based on word count [LIWC], tailoring based on self-report measures [BEQ, CECS], and tailoring from a trained therapist) along with two control groups (standard expressive writing experimental and standard expressive writing control) were used. Specific health and mental health outcomes were examined after one month including healthcare utilization (# of visits to a healthcare provider), physical symptoms (PILL), emotional distress (OQ-45), and PTSD symptoms (PCL). A total of 26 participants completed the study, Repeated measures ANOVAs found no significant differences between conditions on emotional expression or decreases in physical and

mental health. The nonsignificant findings are likely due to low sample sizes and insufficient power for that statistical analyses. The findings highlight the inconsistent findings in the literature surrounding expressive writing studies and outline the importance of adequate sample sizes, experimental design to reduce fraudulent users, and future directions including other measures of expression to include depth of processing.

CHAPTER ONE

REVIEW OF THE LITERATURE

Emotional Expression

Emotions are adaptive. Both positive (joy, excitement, curiosity, etc.) and negative (fear, anxiety, sadness, anger, etc.) emotions help individuals ascertain important aspects of a situation as well as highlight the appropriate course of action (Elliott, Watson, Goldman, & Greenberg, 2004; L. S. Greenberg & Paivio, 1997). Psychological processes that underlie the generation of emotion include associative emotional experience, emotion based upon appraisal of a situation, and finally, degree of goal attainment (L. S. Greenberg, 2008). Emotional processes can occur at the precognitive level, bypassing time-consuming cognitive processes and allowing for adaptive decisive action (L. S. Greenberg & Paivio, 1997). However, emotions can become problematic or maladaptive as a result of trauma or when an individual is taught to ignore or dismiss their emotional experience. Through exposure to one's emotional experience, people can become more aware of their emotions as well as make use of them in a productive manner (Elliott, et al., 2004).

The fundamental task of influencing and adapting maladaptive emotional experiences has formed the basis of many therapeutic strategies, including Gestalt (Kirchner, 2000), Process-Experiential (Elliott, et al., 2004; L. S. Greenberg & Paivio, 1997), Cognitive Behavioral (Beck, 1995), and Exposure Based (Foa & Rothbaum, 1998) therapies. While no consistent definition of emotional expression exists (L. S. Greenberg & Safran, 1989), many of these therapeutic strategies have their roots and commonalities

within emotion theory and emotional processing theory. These theories can help guide the understanding of emotional expression and processing.

Emotion Theory

Emotion theory suggests that emotional experiences are highly adaptive in nature, allowing the organism to process information quickly and resulting in appropriate actions to aid in the satisfaction of personal needs (L. S. Greenberg & Paivio, 1997). Emotional pathways take into account previous experience, and give direction regarding what is important. Through understanding what is emotionally important, the organism can determine what to do; more advanced organisms can determine who they are as individuals (Elliott, et al., 2004; L. S. Greenberg & Paivio, 1997).

Emotional experiences are the result of four emotional schemas (or as Elliot, et al., 2004 describes as “preverbal schemes”) that are present and accessible during emotional processing. These schemas include perceptual-situational, bodily-expressive, symbolic-conceptual, motivational-behavioral, and emotional scheme nuclear processes. These perceptual-situation schemes surround the person’s present environment/situation, as well as an individual’s episodic memories of past environment and situations. The bodily-expressive scheme constitutes a perceptual sensation within the body, as well as nonverbal expressions of emotions. Motivational-behavioral schemes are the link between the emotional process and the associated need, intention, or action required of the emotion. Finally, the emotion scheme nuclear process allows for the organization of the other schemes around a particular emotion, and requires self-reflection upon the other four elements in order to be recognized. According to emotional theory, these systems or

schemes work in harmony when the individual does not neglect one of them. However, when a system is neglected, it becomes more difficult or problematic to process the emotional experience and find closure (Elliott, et al., 2004).

According to this theory, emotions occur to help direct individuals toward the appropriate action. Emotions allow for rapid automatic thinking, which aids in survival and is highly adaptive. However, emotional dysfunction can occur and usually takes one of three forms. The first is use of an overlearned emotional reaction, which might be an inappropriate response that is not congruent with the reality of the situations (e.g., anger response). The second is covering their primary emotional experience with a secondary emotion (e.g., becoming angry when they are actually sad). Finally, the third dysfunction is using one's emotional response to manipulate or control other people (Elliott, et al., 2004; L. S. Greenberg & Safran, 1989).

Within emotion theory, emotional regulation is an important concept; specifically, showing an appropriate amount of emotional expressive congruent with the situation. Emotional regulation is the ability to tolerate and control an emotional reaction, but to be able to put it into words, regulate distress, and channel it to productive ends in order to meet desires and needs. Dysfunctional regulation can occur when one overregulates or is unable to regulate their emotional experience; this results in under-arousal or over-arousal (Elliott, et al., 2004). These regulation patterns are believed to be influenced by an individual's attachment style resulting from childhood experiences (Elliott, et al., 2004; L. S. Greenberg & Paivio, 1997).

Nevertheless, expression of the emotional experience is not the end result; emotion without reason and understanding leads to incoherence. Emotion must be

organized by the individual to construct meaning. This occurs by the synthesis of emotion and reason. It is the meaning derived from the emotional experience and reflection that is the mechanism of therapeutic change (L. S. Greenberg, 2008).

In the therapeutic application of emotional theory, engaging in the emotional process is central for creating therapeutic change. The goal is for the individual to become aware of their emotional experience and allow these emotional experiences to guide their course of action (L. S. Greenberg & Safran, 1989). Empirically based principles to guide emotion-based interventions have been proposed (L. S. Greenberg, 2008; L. S. Greenberg & Pascual-Leone, 2006) for use in psychotherapy. Principles include increasing awareness of both an emotional experience, as well as the arousal created through the experience of emotion; helping individuals express their internal and external emotional experiences; enhancing an individual's ability to appropriately regulate their emotions; and reflecting upon their emotional experience with the primary goal of constructing the meaning of that emotional experience. Finally, it is possible to work towards transforming one's maladaptive emotional experiences (L. S. Greenberg, 2008; L. S. Greenberg & Pascual-Leone, 2006). These principles guide the therapists' moment-to-moment interactions in session, leading to the important information relevant to the emotional experiences that will allow the therapist to deepen the individual's experience, and finally to create new meaning (L. S. Greenberg & Safran, 1989).

Emotion-focused treatments have been utilized for many populations, including people with depression (Pos, Greenberg, & Warwar, 2009), people in couple's therapy (reference needed- I can look for this if you don't have it), and even with cancer survivors (Giese-Davis et al., 2002). While emotion theory helps distinguish between

functional and dysfunctional emotional schemes and regulation, the goal of this theory is not to explain how these emotional experiences become pathological. Foa and Rothbaum's (1998) emotional processing theory helps define how emotional experiences become problematic for individuals who have experienced a traumatic event, which is also important in providing rationale for the use of emotion in treatment.

Emotional Processing Theory

Emotional processing theory is an integration of cognitive, learning, and personality theories used to address how some individuals are able to recover from traumatic events successfully, whereas others develop Post Traumatic Stress Disorder (PTSD). Emotional experiences and cognitions surrounding stressful or traumatic events, such as a death of a family member, can be re-experienced multiple times. A typical trajectory is a decrease in the re-experiencing of distress caused by memories as time passes. Conversely, only a slight decrease in re-experiencing symptoms will be seen in individuals who go on to develop PTSD (Foa & Rothbaum, 1998).

Specific and generic environmental and internal stimuli are associated with a fear response after exposure to a traumatic event via operant and classical conditioning. However, in addition to the associated learning, the explanations for these events are constructed through an individual's associated meaning (Foa & Kozak, 1986). Therefore, after being exposed to a traumatic event, an individual can develop faulty cognitions or associations related to the trauma and linked to specific emotional reactions (e.g., fear, anxiety, etc.), as a result of changes in the schema brought forth by changes in meaning (Foa & Rothbaum, 1998). For instance, a woman who was raped at knifepoint by a bald

man might make the faulty association that bald men are more likely to carry knives and therefore are dangerous. This faulty association leads to the activation of a fear-based emotional response when encountering bald men. Individuals with PTSD are more likely to have multiple erroneous associations within their cognitive schema, which aids in the belief that the world is a very dangerous place, as well as feelings of fear, anxiety, and incompetence. Future interactions with others and within different settings will be filtered through the revised post-trauma schema, which can lead to further feelings of inadequacy (Foa & Kozak, 1986; Foa & Rothbaum, 1998). Emotional processing occurs throughout life, with the associated emotional responses increasing and decreasing in response to new information and experience (Foa & Kozak, 1986).

Successful therapy for PTSD involves emotional processing with activation of the maladaptive cognitive schema, while presenting incompatible new information at the same time. This mirrors the process of natural recovery from trauma. Therefore, emotional processing theory proposes that negative symptoms resulting from a traumatic experience will decrease as an individual focuses upon their inaccurate thinking about the event, along with prolonged exposure through gradual recounting of the experience in detail (Foa & Rothbaum, 1998). As an individual recounts the trauma as well as their reactions to the event, they can start to modify negative cognitive representations that surround the event or their experience of the event (Foa & Kozak, 1986).

Emotional processing theory has led to evidence-based treatments for PTSD, specifically Prolonged Exposure treatment (Foa & Rothbaum, 1998), which has been shown to be an effective treatment for combat trauma (Tuerk et al., 2011) and sexual assault (Rothbaum, Astin, & Marsteller, 2005), among many other types of trauma. It has

also influenced Cognitive Processing Therapy (Resick & Schnicke, 1993), which has been shown to be an effective treatment for PTSD symptoms associated with sexual assault (Resick & Schnicke, 1992), childhood sexual abuse (Chard, 2005) and combat related trauma (Monson et al., 2006).

Model of Emotional Expressivity

As mentioned above, there has been no consensus regarding a definition of emotional expression (L. S. Greenberg & Safran, 1989). Additionally, the definition has evolved over the last century (Gross & John, 1998). Gross and John (1995, 1997, 1998) define emotional expressivity as the behavioral changes associated with emotional experiences that can be thought of as observational behavioral reactions (e.g., crying, laughing, etc.); however, the measurement of emotional expressivity is based on behavioral observations of an internal experience (Gross, John, & Richards, 2000). They propose a model of emotional expressivity (see Figure 1) where an input triggers an emotional program (e.g., anger). The program prepares the organism for action (e.g., a response tendency), which may or may not be expressed visibly (Gross & John, 1995). Individuals modulate their responses to societal emotional display norms (e.g., not laughing at a funeral) or for personal reasons (e.g., not to appear weak; Gross & John, 1997). In Gross and John's (1995, 1997) model, emotional expressivity is seen as a trait. To understand stable differences within an individual's expressivity is, therefore, dependent upon an their emotional response tendencies and the degree to which they express emotion behaviorally. Therefore, differences in emotional response tendencies give rise to differences in expressivity (Gross & John, 1995, 1997).

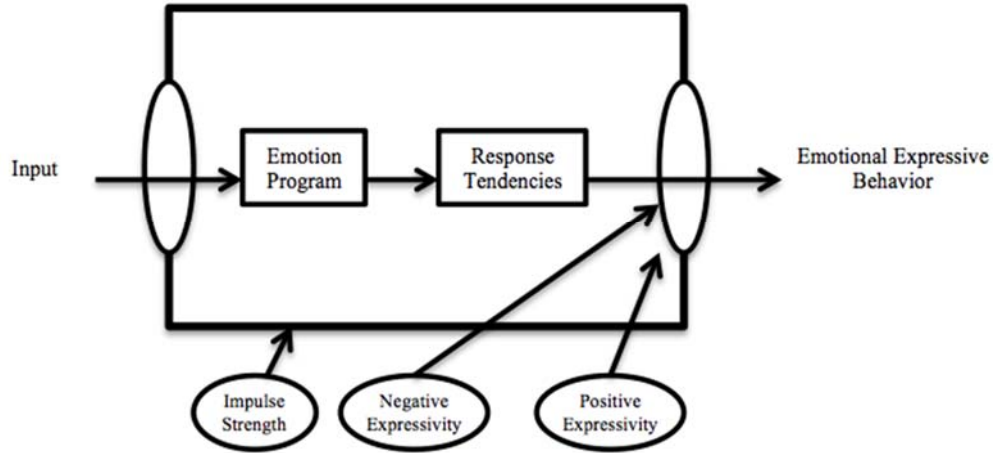


Figure 1: Gross & John's (1997) Model of Emotional Expressivity

Three factors influence emotional expression within this model; this includes the impulse strength of the emotion and their negative and positive emotional expressivity (Gross & John, 1995, 1997). Impulse strength can be defined as the strength or intensity of the emotional response tendency after an emotional program has been activated. Negative expressivity is associated with the negative emotions that one experiences, and is related to the tendency to control negative emotions. Conversely, positive expressivity is related to the experience of positive emotions. It is important to note that individuals who express positive emotions are also likely to continue to express negative emotions, as general expressivity is a higher order factor of expressivity itself (Gross & John, 1995).

Measurement of Emotional Expression

A variety of approaches for the measurement of emotional expression have been proposed and utilized (see Pennebaker, Mehl, & Niederhoffer, 2003 for a review).

Emotional expression has been measured through self-reported measures (Gross & John, 1995, 1997, 2003), linguistic analysis of written text (Pennebaker, Francis, & Booth, 2001), and by means of devices aimed at capturing the emotional expression that occurs in a person's daily life (e.g., electronic activated recorder [EAR]; Mehl, Pennebaker, Crow, Dabbs, & Price, 2001). Each of these methods allows for measuring slightly different aspects of emotional expression. Self-report measures often measure an individual's trait emotional expression (Gross & John, 1995) but can gauge their current emotional state (e.g., Bradley & Lang, 1994). Linguistic analysis allows researchers to measure a subject's emotional expression during a writing task. However, one's emotional state can influence a creative process but it moderated uniformly based on an individual's emotional state and trait related expressivity (Zenasni & Lubart, 2008). While naturalistic emotional expressivity devices (e.g., EAR) present new avenues of research into both state and trait emotional expressivity, they are beyond the scope and practical application of the current study.

Self-Report Emotional Expression

Multiple measures exist to assess a diverse range of emotional expressivity, ranging from facial emotional expressivity (e.g., Beer, Heerey, Keltner, Scabini, & Knight, 2003) to those measuring expressivity of both trait (Gross & John, 1995, 1997, 2003) and state (e.g., Bradley & Lang, 1994). Self-reported measures of emotional expressivity are justified due to individuals' ability to adequately report observable traits, and the fact that self-report measures correlate with peer ratings of emotional behaviors and predict behavioral responses (Gross & John, 1995, 1997).

Gross and John (1998) identified five factors of trait emotional expressivity, including: emotional confidence, masking, positive expressivity, negative expressivity, and impulse intensity. Emotional confidence is one's ability to use effective strategies to regulate mood and emotion. However, masking is the ability or perceived ability to regulate negative emotions in public settings. It is important to note the author's critique of this strategy, which holds that the data showed no evidence of its effectiveness. Positive and negative emotional expressivity is related to the individual's ability to experience and display positive and negative emotion, respectively. Finally, impulse intensity is the strength of the emotional state that one experiences (Gross & John, 1998).

Finally, strategies relating to dealing with emotional expression are also important to measure. Gross and John (2003) identify two approaches towards unwanted emotional expression; this includes cognitive appraisal and expressive suppression. Cognitive appraisal involves cognitively changing the emotion-eliciting situation in order to modify its emotional impact. This approach is generally antecedent-focused, seeking to impact before the emotions impact the individual by altering the individual's emotional trajectory. Conversely, expressive suppression involves moment-by-moment response modulation to inhibit emotionally expressive behavior. This approach is generally response-focused, and seeks to modify the behavioral emotional response tendencies (Gross & John, 2003).

To measure one's emotional expression state, measures such as the Self Assessment Manikin (SAM) allow for the measurement of an emotional experience immediately after a stimulus is presented. Thus, an individual's emotional state can be

measured simply and directly to assess a stimulus's emotional valence and intensity (Bradley & Lang, 1994).

Text Analysis

Software packages aimed at analyzing written text have existed since the 1960s; the General Inquirer (Stone, Dunphy, & Smith, 1966) is considered to be one of the first text analysis programs (Berry, Pennebaker, Mueller, & Hiller, 1997). This program consists of complex word counting routines; additionally, this program allows the user to identify numerous words with more than one meaning (i.e., homographs) using preprogrammed rules aimed at clarifying meaning. It can be used to study any topic once a custom dictionary is created. Its ability to perform content-dependent word counts is an advantage, however, it has been noted that it might not be worth the effort to create custom dictionaries with appropriate context rules (Pennebaker, et al., 2003).

Other computerized text analysis programs include TAS/C (Mergenthaler, 1996), DICTION (Hart, 2001), Psychiatric Content Analysis and Diagnosis program (PCAD; Gottschalk, 1995; Gottschalk, Winget, & Gleser, 1969), and Linguistic Inquiry and Word Count (LIWC; Pennebaker, et al., 2001). The TAS/C program focuses upon emotional tone and abstraction. It defines emotional tone as the density of emotion words used within a given text segment; conversely, abstraction is the number of abstract nouns within the same segment (Mergenthaler, 1996). DICTION was created to analyze political speeches and measure verbal tone across five domains. These domains include activity, optimism, certainty, realism, and commonality (Hart, 2001). The PCAD program was designed to emulate text that has been analyzed by trained coders regarding a

number of different facets (Gottschalk, 1995; Gottschalk, et al., 1969). The strength of PCAD is that it allows for context to be taken into consideration. However, the scoring rules of the coding of emotion remain unclear (Bantum & Owen, 2009).

LIWC is a computer program designed to measure the emotionality of language (Pennebaker & Francis, 1996). LIWC will scan the subject's writing and words will be assigned to one or more categories based on a specific word bank. LIWC gives a percentage score based on how many words fit into a category versus the total word count (Pennebaker, et al., 2001). Furthermore, Bantum and Owen (2009) confirmed LIWC to be a valid instrument for identifying emotional expression in linguistic data. However, LIWC does appear to over-identify emotional expression (Bantum & Owen, 2009).

LIWC was chosen to analyze text in the present study due to the robust literature showing the effectiveness of the program in identifying differences between individuals who score high on emotional expression and the subsequent changes in their physical and mental health; it is widely used to analyze text in psychology. Additionally, previous research has documented an analogous LIWC program that is useful for web-based studies. This Perl-based replication of the original LIWC program was developed by Jason Owen, Ph.D., M.P.H., and the results of this web based LIWC application for intervention was recently published (Owen, Hanson, Preddy, & Bantum, 2011). The authors concluded that this program results in a replication of emotional expression almost identical to the original LIWC program.

Beyond expressive writing paradigms, LIWC has been utilized in a variety of ways in attempt to better understand the role of linguistic factors. A non-exclusive list of

the uses of LIWC include examining the emotional, cognitive, social, and psychological lives of individuals by analyzing online message board posts in the days and weeks after the September 11 attacks (Cohn, Mehl, & Pennebaker, 2004). Similarly, LIWC was used to analyze breast cancer conversations online (Alpers et al., 2005; Cordova, Cunningham, Carlson, & Andrykowski, 2001), as well as essays written by smokers and nonsmokers (Alexander-Emery, Cohen, & Prensky, 2005). A few studies have used LIWC to examine song lyrics (DeWall, Pond, Campbell, & Twenge, 2011; Petrie, Pennebaker, & Sivertsen, 2008). LIWC has been used with the program Coh-Metrix to aid in natural language processing and analyze features of deception (Duran, Hall, McCarthy, & McNamara, 2010). The diversity in the application of LIWC shows the wide range of applicability for this program and its usefulness as a tool for the measurement of emotion and other facets of the human experience.

Pennebaker's Expressive Writing Paradigm

Standard Condition

In the 1980s, Pennebaker and Beall started the expressive writing paradigm after noting how individuals who suffered a traumatic or stressful event and did not confide in others developed worse health outcomes as opposed to others who did share and express their feelings (e.g., Pennebaker & Hoover, 1986). In this seminal research, Pennebaker and Beall found that college students who wrote about their trauma and expressed emotion as a part of that experience showed initial increases in arousal symptoms (i.e., blood pressure) after writing, but showed long-term decreases in health problems. Therefore, emotional expressivity appears to have an important effect, since those who

just wrote about the facts of a trauma fared similarly to the control group and did not have the same benefits as those who wrote about their emotional experiences (Pennebaker & Beall, 1986). Thus was founded Pennebaker's emotional writing paradigm, which has resulted in numerous studies showing similar and consistent results.

In Pennebaker's writing paradigm participants are asked to write about a traumatic and upsetting experience over three to five days for twenty minutes per session (Pennebaker, 1997). Generally, the instructions are similar to the following passage (taken from Pennebaker & Chung, 2007):

For the next three days, I would like for you to write about your very deepest thoughts and feelings about the most traumatic experience of your entire life. In your writing, I'd like you to really let go and explore your very deepest emotions and thoughts. You might tie this trauma to your childhood, your relationships with others, including parents, lovers, friends, or relatives. You may also link this event to your past, your present or your future, or to who you have been, who you would like to be, or who you are now. You may write about the same general issues or experiences on all the days of writing or on different topics each day. Not everyone has a single trauma but all of us have had major conflicts or stressors – and you can write about these as well. All of your writing will be completely confidential. Don't worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up.

The experiences reported in traditional studies have ranged from the loss of a relationship or pet to physical and sexual abuse, rape, and loss of loved ones (Pennebaker, 1997). Variations of the writing paradigm and their efficacy have also shown some interesting effects. Generally, participants are compared with experimental controls asked to write about daily activities or other mundane writing tasks (Pennebaker & Chung, 2007). Having a control group within the experimental design allows the researcher the ability to see if the finding is unique to disclosure as well as to test the moderator relationship within the paradigm (Lumley, Tojek, & Macklem, 2002).

A few hypotheses have been proposed as to why the writing paradigm has resulted in improvements to physical and mental health. Initially, when questioning whether the inhibition of trauma leads to increased health problems, it was hypothesized that if inhibition surrounding a traumatic memory is reduced then one's health will increase (Pennebaker, 1997). However, this has not been supported by the scientific literature (M. A. Greenberg & Stone, 1992). The expressive writing scientific community turned to examining what participants were actually writing; this led to the creation of LIWC. Results found that those who write with increased positive emotion and moderate levels of negative emotion enjoy improved health outcomes. However, high and low negative emotion resulted in poor health. Finally, casual and insight words were also related to improved health outcomes (Pennebaker, 1997; Pennebaker & Seagal, 1999). It is now believed that the individuals who benefit from expressive writing are those with poorly organized descriptions of events who go on to develop coherent stories over the course of their writing (Pennebaker, 1997).

Pennebaker has noted that no single theory can explain how or why the expressive writing paradigm shows effectiveness (Pennebaker, 2004). Furthermore, the underlying mechanism has received less research attention and is not well understood (Sloan & Marx, 2004b). This might be partly due to expressive writing working in numerous areas, including cognitive, emotional, and biological. Additionally, there are a number of processes occurring within the individual as they write. Writing helps the individual organize their narrative into a coherent story. As they confront events, they are engaging in habituation and extinction processes (Pennebaker, 2004). Writing about the events might help to free up some of their working memory (K. Klein & Boals, 2001) or alter

how they talk with others or view matters of social justice (Pennebaker, 2004).

Additionally, the outcomes of emotional writing studies might be due to the mechanism of changes in emotional, cognitive, and behavioral factors (Esterling, L'Abate, Murray, & Pennebaker, 1999).

Experimental Variants

Variations on the expressive writing paradigm have been utilized. In an early meta-analysis, a trend was observed showing that more days of writing showed stronger effects, suggesting that writing more over a longer period of time might be more effective (Smyth, 1998). The outcome is not affected by the time frame between writing sessions, regardless if participants finish the writing within one day or three days (Chung & Pennebaker, 2008). Furthermore, dosage effects have been illustrated, but writing seems to have beneficial results even when done for as little as two minutes over the course of two days (4 minutes total; Burton & King, 2008). It has been noted that many of the changes may become apparent soon after the writing has concluded, while other changes may take longer to emerge. Therefore, no standard time frame for follow up has been identified (Kacewicz, Slatcher, & Pennebaker, 2007). However, it is important to note that studies with fewer than three writing sessions had a smaller effect size, even though number of sessions does not moderate outcome (Frattaroli, 2006).

Participants engaging in writing as compared to speaking appeared to undergo similar effects. While individuals instructed to verbally express themselves showed an increased total number of words, those who worked in written expression showed an increase in positive emotion words (Esterling, Antoni, Fletcher, Margulies, &

Schneiderman, 1994). This might be due to differences in how one may express oneself verbally compared with how one writes (De Giacomo, L'Abate, Pennebaker, & Rumbaugh, 2010).

Writing about a single traumatic event over the course of several days appears to be more beneficial than writing about multiple different events (Sloan, Marx, & Epstein, 2005). However, this finding was not upheld within a meta-analysis, which suggested that writing about multiple traumas or a single trauma did not influence the outcome (Frattaroli, 2006). Nevertheless, Frattaroli's finding did not take into account specific symptomology (e.g., PTSD), which in theory suggests it would be beneficial to focus upon a single event (Foa & Kozak, 1986; Foa & Rothbaum, 1998).

Changes in the instructions have also been shown to affect outcomes. Having participants write about positive events is shown to decrease illness and increase mood (Burton & King, 2004). Additionally, instructions based on increasing emotional processing show increased benefits over those that just focus on cognitive processing or insight (Hunt, Schloss, Moonat, Poulos, & Wieland, 2007; Sloan, Marx, & Epstein, 2007). Given these findings, the present study aimed to utilize a three day writing paradigm focusing upon a single traumatic event, rather than multiple different events, to maximize the therapeutic effect, and is focused on increasing both positive and negative emotional expression.

Benefits of Emotional Expression

Emotional writing about stressful or traumatic experiences has been found to be beneficial for individuals' emotional and physical health in comparison to those engaged

in writing about a neutral topic. Additionally, individuals have commented that the experience is “valuable and meaningful” (Pennebaker, 1997; Pennebaker & Francis, 1996). Emotionally expressive writing allows the participant to think about their experience, organize their thoughts, and process the event, which often leads to positive mental and physical effects months after writing. Writing about an emotional experience forces the subjects to think about their emotional experience in new ways and organize their thoughts about the event; furthermore, a positive mental and physical effect is seen months after writing (Pennebaker, 2004). The expressive writing paradigm has been tested in over 250 studies as of 2006, with only a few studies showing negative or no effects (Frattaroli, 2006). However, it is important to note that not all studies have shown physical and mental health benefits (e.g., Kloss & Lisman, 2002) which suggests that a “file drawer” effect could occur.

Physical Benefits

Meta-analytic studies have showed that the expressive writing paradigm effectively improves physical health outcomes (Frattaroli, 2006; Frisina, Borod, & Lepore, 2004; Smyth, 1998). Furthermore, the expressive writing paradigm has been shown to benefit multiple populations (Frisina, et al., 2004), ranging from healthy populations (e.g., college students; Pennebaker & Beall, 1986), to chronic conditions such as asthma or rheumatoid arthritis (Smyth, Stone, Hurewitz, & Kaell, 1999), potential life-threatening conditions such as cancer (Low, Stanton, & Danoff-Burg, 2006) and even prisoners (Richards, Beal, Seagal, & Pennebaker, 2000). It is important to note that many of the physical and mood symptoms significantly increase in the initial period after

writing, but then significantly decrease at follow-up; weeks or months later for those with self-reported severe traumas (M. A. Greenberg & Stone, 1992)

Specifically, the expressive writing paradigm has shown improvement in decreasing the number of health center visits (e.g., M. A. Greenberg & Stone, 1992; Pennebaker & Beall, 1986; Pennebaker, Colder, & Sharp, 1990; Pennebaker & Francis, 1996; Pennebaker, Mayne, & Francis, 1997) and infirmity visits (e.g., Richards, et al., 2000), along with decreases in self-reported physical symptoms (e.g., M. A. Greenberg & Stone, 1992; Pennebaker, et al., 1997; Richards, et al., 2000; Sloan, et al., 2007). Physiological markers of health have also been shown to change following the expressive writing paradigm, including antibodies for Epstein-Barr (e.g., Esterling, et al., 1994) and Hepatitis B, (e.g., Petrie, Booth, Pennebaker, Davison, & Thomas, 1995), decreased HIV viral load (e.g., O' Cleirigh et al., 2003), and decreased blood pressure (e.g., McGuire, Greenberg, & Gevirtz, 2005).

Psychological Benefits

The expressive writing paradigm has shown considerable but inconsistent benefits on self-report measures related to psychological health. In the most comprehensive meta-analysis surveying over 250 studies, Frattaroli (2006) found that, in general, expressive writing had positive effects on anger (e.g., Vedhara et al., 2010), increased positive mood (e.g., M. A. Greenberg & Stone, 1992; Pennebaker, et al., 1990), decreased negative mood (M. A. Greenberg & Stone, 1992), and depression (e.g., Gortner, Rude, & Pennebaker, 2006; Lepore, 1997; Sloan, et al., 2007). This similar trend is noted in other meta-analyses (Frisina, et al., 2004; Pennebaker, 1997; Smyth, 1998). However, it

appears that expressive writing is less effective for psychiatric than for physically ill populations (Frisina, et al., 2004).

It is important to note that mixed findings have been found with regard to PTSD symptoms; some studies have failed to show reductions in PTSD symptoms through the expressive writing paradigm (Sloan, Marx, & Greenberg, 2011; Smyth, Hockemeyer, & Tulloch, 2008) and one study found increases in symptoms (Gidron, Peri, Connolly, & Shalev, 1996). However, other studies have been found to show adequate reductions in symptomology (Sloan & Marx, 2004a; Sloan, et al., 2005, 2007). These mixed findings might be attributed to, in part, small sample sizes and failure to screen for minimal PTSD symptoms.

Behavioral Effects

A few behavioral effects of emotional writing have been noted. These behavioral effects have included the following: participants improving their grades in college (Lumley & Provenzano, 2003; Pennebaker, et al., 1990; Pennebaker & Francis, 1996); senior level individuals finding employment (Spera, Buhrfeind, & Pennebaker, 1994); and intimate relationships lasted longer if members of the couple engaged in the expressive writing paradigm (Slatcher & Pennebaker, 2006). Finally, expressive writing shows promise as an intervention for helping with insomnia (Harvey & Farrell, 2003).

Moderating Variables

A few moderating variables have been identified through meta-analytic studies. Moderators that influence outcomes include the study's published status; it is not

surprising that published papers tended to have larger effects (Frattaroli, 2006), specifically with regard to psychological benefits (Smyth, 1998).

The setting in which the studies took place also influences the findings; thus, populations with increased physical or psychological symptoms were more likely to show improvements, and floor effects were observed in “healthy” populations. Furthermore, individuals with a history of traumatic events have shown greater subjective decreases in symptoms, but others did benefit from disclosure (Frattaroli, 2006). Mixed findings have been present with regard to college students and community samples benefiting the most from expressive writing. Smyth (1998) noted a larger psychological symptom reduction within a college population, whereas Frattaroli noted smaller effects when compared to a community sample. Furthermore, it has been noted that the setting where the students’ writing occurs directly influences the outcome; students who write at home show greater benefits compared to writing in a controlled setting (Frattaroli, 2006).

A number of participant variables have been examined. Smyth (1998) reported gender as a moderator, whereas the number of males in the studies was related to higher effect sizes but not necessarily related to psychological or physiological functioning. However, this was not confirmed in Frattaroli’s larger meta-analysis. Non-significant participant moderators included ethnicity, age, or education level; these non-significant findings may be due to the populations studied. The factors of increased stress, worsening physical health, and lower optimism levels were more impacted, whereas mood, neuroticism, alexithmia, and emotional inhibition had no effect. However, Frattaroli points out that these variables may seem to have little effect due to the small number of studies that have actually examined these variables. Finally, receiving or not receiving

payment, nor being primed regarding disclosure, did not moderate the effect of the expressive writing paradigm (Frattaroli, 2006).

Studies in which the follow-up is less than one month show greater psychological effects than studies with longer follow-up periods (Frattaroli, 2006). Frattaroli speculates that the effects of an intervention of this type may wane as time goes on, especially regarding psychological benefits. However, it is important to note that benefits of expressive writing have been documented to last over one year (Pennebaker, Barger, & Tiebout, 1989). The timing of the experimental dosage does not appear to influence experimental results, which suggests that experimental flexibility (daily vs. weekly) can be utilized within experimental designs to fit both experimenter and participant schedules (Frattaroli, 2006). However, Smyth found that longer delays produced greater results. Finally, experimental variants, such as changing the disclosure focus to either positive or negative events, appear to have similar benefits on the outcome (Frattaroli, 2006) as well as writing about either past or current traumas (Smyth, 1998).

Linguistic Tailoring

Tailoring is defined as both information and a change strategy derived from the assessed characteristics unique to that individual, which are related to a specific outcome of interest (Kreuter, 2000; Kreuter, Bull, Clark, & Oswald, 1999; Kreuter & Skinner, 2000). The tailored messages are intended for a particular individual, based on their individual-level factors related to a specific behavioral or health-related outcome. Parallels can be drawn between tailored clothing or clothing made to fit a particular individual, and tailored messages are written to influence an individual's specific actions,

often related to specific health outcomes. Tailoring can be contrasted with targeting, which is the process of influencing group behavior (Kreuter & Skinner, 2000).

Tailoring influences an individual's motivation through matching content to an individual's needs and interests. Furthermore, tailoring enables the information to be presented within a meaningful context. However, one needs to have a mechanism to gather the information from the population in which the tailoring is being utilized (Dijkstra & De Vries, 1999; Rimer & Kreuter, 2006). In general, tailored messages have been shown to be superior to standard instructions (Keller & Lehmann, 2008). Furthermore, dynamic messages, the messages that build upon subsequent information, have been found to be more beneficial than messages that are static or just based on a single assessment (Krebs, Prochaska, & Rossi, 2010).

Computer-tailored interventions have been used successfully to change health behaviors such as dietary changes and increasing physical activity (for a review see Kroeze, Werkman, & Brug, 2006), which many have been found to be effective. Specifically, a number of studies have found tailoring and feedback to be effective in changing health behavior related to diet (e.g., Long et al., 2006; Winett et al., 1999), physical activity (e.g., McKay, King, Eakin, Seeley, & Glasgow, 2001; Napolitano et al., 2003; Winett, et al., 1999), smoking (e.g., Buller et al., 2008; Lenert, Muñoz, Perez, & Bansod, 2004; Strecher, Shiffman, & West, 2005; Swartz, Noell, Schroeder, & Ary, 2006), and alcohol consumption (e.g., Chiauuzzi, Green, Lord, Thum, & Goldstein, 2005; Matano et al., 2007). Furthermore, all of these health behaviors were found to have significant changes with regard to tailored messages in a recent meta-analysis (Krebs, et al., 2010). However, it is important to note that a few studies noted no changes with

regard to tailored messages beyond the benefits of standard impersonalized messages for physical exercise (Hageman, Walker, & Pullen, 2005; Hager, Hardy, Aldana, & George, 2002; Marshall, Leslie, Bauman, Marcus, & Owen, 2003).

The mechanism underlying tailored messages might be due to individuals shifting their thinking when it applies to them. Cognitive shifts have been noted with regard to tailored messages when compared with generic messages. In a study focused on weight loss, patients who received a tailored message had more positive cognitions (Kreuter, et al., 1999). However, it is important to note that these researchers failed to examine actual weight loss in conjunction with the materials, which could have demonstrated a mediation model between cognitive shift and actual behavioral change.

The benefit of computerized feedback is that it allows for customization and tailored messages, assessments, and tools for the individual (Lustria, Cortese, Noar, & Glueckauf, 2009). Computer-tailored feedback is particularly helpful if it is provided immediately after completing a battery of measures (Vandelanotte, De Bourdeaudhuij, Sallis, Spittaels, & Brug, 2005) and if it contains suggestions on ways to improve (Weaver, 2006).

Tailoring within an Expressive Writing Paradigm

The prescriptive need for tailoring, specifically related to decreased distress in cancer patients, has been documented in the literature (Stanton et al., 2002). However, only one study to date has examined linguistic tailoring and feedback for participants (Owen, et al., 2011); it is important to note this study focused on college students at a university rather than a specific medical population (e.g., cancer patients). However,

Pennebaker's research team does have a study that is currently underway using tailoring to give written feedback (Pennebaker, 2011 personal correspondence). In Owen et al.'s study, the authors found that emotional expression could be increased through feedback as simple as telling an individual if their emotional expression was high, average, or low. However, one of the major limitations of Owen, et al. was that these authors only focused upon increasing linguistic markers of emotional expression rather than on mental and physical health benefits. Therefore, it is unknown if increasing an individual's emotional expression through feedback will result in an increase in physical and mental health benefits beyond those of traditional expressive writing paradigms. In Owen et al.'s study, the researchers focused on giving feedback initially after the participants writing session and then gave generic instructions before subsequent writing sessions. In the present study, the feedback messages have been included within the subsequent writing instructions to maximize their importance and decrease the chance they will be forgotten. Another criticism of Owen et al. is the study's use of generic feedback messages without a theoretical basis. The present study aims to use clinically relevant feedback.

Present Study

The present study aims to go beyond the standard linguistic writing paradigm set forth by Pennebaker to include feedback. Pennebaker (1997) has noted that the writing paradigm was not designed to employ feedback, but rather to do just the opposite (Pennebaker, 1997). Participants initially would turn their essays in to a box, ensuring their anonymity (Kacewicz, et al., 2007; Pennebaker, 1997). Even without feedback, many individuals in expressive writing studies developed a writing style that promoted

changes in their mental and physical health (Esterling, et al., 1999). Another author cautioned against using feedback in expressive writing as an adjunct to psychiatric treatment (Baikie & Wilhelm, 2005).

Expressive writing analysis using Latent Semantic Analysis (LAS), which examines the coefficients of similarity between essays in a reliable and multidimensional manner, has provided several important findings. The similarity between subsequent writing sessions is linked to increases in physician visits upon follow-up. Conversely, participants who changed their writing styles between sessions were found to have made improvements in their health upon follow-up (Campbell & Pennebaker, 2003). The basic premise of feedback is that it should act like a catalyst for positive change (Barbour, 2003), in this case, to enable change within the writing paradigm.

The feedback given here will be dependent upon one's condition and will utilize both computer-assisted feedback as well as feedback from a trained human. This comparative paradigm has its roots in the Turing test, whereas a computer is used to imitate human behavior in an attempt to fool humans (Turing, 1950). However, the goal of the present study is not, as in the Turing experiments, to show that a machine can think, but rather to see if messages derived from logical statements can form the basis of tailored feedback to influence human behavior, notably emotional expression, and be as relevant as one generated by a trained therapist.

The present study will utilize a total of three feedback conditions. One of the messages will utilize a therapist's feedback with special constraints (e.g., word limit similar to computer assisted). The other two messages will be computer-assisted feedback messages, one based on self-report measures, similar to much of the static tailoring

literature (see Krebs, et al., 2010). The second computer-assisted feedback message will use the basic framework of Owen et al. (2011). Feedback messages will utilize messages derived from Emotional Theory (Elliott, et al., 2004) and Emotional Processing Theory (Foa & Kozak, 1986). The aim of the messages is to expand upon the participant's emotional expression through deepening their awareness of their emotions. This includes the emotions and emotional experiences that the participant felt during the traumatic or stressful experience, as well as the emotions or bodily sensations that the participant currently experiences while thinking about the event.

While both the linguistic tailoring (based on LIWC) and self-report tailoring (based on pre-writing assessments) share common verbiage and wording; notable differences exist. The largest difference exists in the targeted measurement. The linguistic tailoring will be based upon the participant's emotional expression state. Conversely, the feedback given based on self-report data will focus more on answers to trait-like emotional expression measures. Currently, no literature exists regarding the use of self-reported measures to influence emotional expression in an expressive writing paradigm. The therapists will have no objective measure of the participant's trait or state emotional expression. They will only have their trained subjective assessment of the participant's ability to express themselves from a therapeutic standpoint.

Aims & Hypotheses

Aim 1: To replicate previous research findings that emotional expression positively affects mental and physical health. Specific a priori planned comparisons were used for this aim to demonstrate replication of previous research.

- **Hypothesis 1.1:** The individuals who receive the standard linguistic writing instructions will have decreased physical health symptoms upon follow-up as compared to the control instructions.
- **Hypothesis 1.2:** The individuals who receive the standard linguistic writing instructions will have decreased levels of distress upon follow-up as compared to the control instructions.
- **Hypothesis 1.3:** The individuals who receive the standard linguistic writing instructions will have decreased symptoms of PTSD upon follow-up as compared to the control instructions.
- **Hypothesis 1.4:** The individuals who receive the standard linguistic writing instructions will have decreased use of healthcare services upon follow-up as compared to the control instructions.

Aim 2: To determine if feedback changes the amount of emotional language used in writing.

- **Hypothesis 2.1:** Individuals in the control group will have the lowest amount of total emotional expression and individuals who receive tailoring (groups 3-5) will have increased expressive over the standard linguistic writing instructions (group 2) or control instructions (group 1).
- **Hypothesis 2.2:** Individuals in the control group will have the lowest amount of negative emotional expression and individuals who receive tailoring (groups 3-5) will have increased expressive over the standard linguistic writing instructions (group 2) or control instructions (group 1).

- **Hypothesis 2.3:** Individuals in the control group will have the lowest amount of positive emotional expression and individuals who receive tailoring (groups 3-5) will have increased expressive over the standard linguistic writing instructions (group 2) or control instructions (group 1).

Aim 3: To determine if feedback on emotional expression enhances mental and physical health over previous emotional expression writing paradigms.

- **Hypothesis 3.1:** The individuals who receive tailoring will have decreased physical health symptoms upon follow-up as compared to the standard linguistic writing instructions or control instructions.
- **Hypothesis 3.2:** The individuals who receive tailoring will have decreased levels of distress upon follow-up as compared to the standard linguistic writing instructions or control instructions.
- **Hypothesis 3.3:** The individuals who receive tailoring will have decreased symptoms of PTSD upon follow-up as compared to the standard linguistic writing instructions or control instructions.
- **Hypothesis 3.4:** The individuals who receive tailoring will have decreased use of healthcare services upon follow-up as compared to the standard linguistic writing instructions or control instructions.

CHAPTER TWO

METHODS AND PROCEDURES

Participants

This study included a convenience sample of individuals who were willing to participate in the study after reading online postings asking for participants to participate in a study on expressive writing (see below for advertisement). It is estimated that the general population has prevalence rates of current or historical PTSD between 3.4 and 3.3 respectfully (Pagoto et al., 2012); however, the DSM-IV places the prevalence rate for PTSD around 8% (APA, 2000).

It is important to note that the data presented in this dissertation is frozen data from an active scientific study where data collection is still occurring. Therefore, the data presented are preliminary findings based on a smaller sample size recruited for the study between October 1, 2012 and January 3, 2013.

Recruitment

Recruitment took place through facebook groups, yahoo groups, and other publically-identifiable listservs and forums with the following advertisement:

Are you interested in participating in research to improve the lives of those who have suffered a stressful or traumatic event? If so, please go to <http://expressyourself.cancri.net/> to find out more about the study and see if you are eligible to participate. If you should decide to participate, you would be randomized to one of five different conditions and would be asked to write for 20 minutes a day on 3 consecutive days of your choice about a previous traumatic event. You would also be asked to complete an online questionnaire, which takes approximately 30 minutes to complete before starting to write and after a brief period after completion of your 3

days of writing. Those who complete the study will be eligible to receive up to \$15 in gift cards to Amazon.com

Participants must have been at least 18 years old or older and fluent in English as well as having access to the Internet. The aim was to recruit between 300-500 participants who meet the inclusion criteria of the study. However, by the end of the data collection for this dissertation, only 27 participants had complete data (see below for breakdown of the subjects); however, there was only one individual within the self-report feedback condition and therefore that group was excluded from the study leaving a total of 26 individuals.

Inclusion/Exclusion

Participants were screened for sub-clinical to clinical levels of PTSD for inclusion in the study. Participants had to endorse PTSD symptoms greater than 17 on the PTSD Checklist (PCL) to be considered for the study. This methodology is similar to Sloan et al. (2007), which ensures that participants have symptoms to be reduced in order to minimize any floor effects. Additionally, participants were excluded from the study if they are unable to read and respond to questionnaires. Inclusion or exclusion for this study was not based gender, pregnancy or childbearing potential, racial/ethnic origin, sexual orientation, or religious affiliation. Eligibility for participation in the study was determined by indicated PTSD symptoms, ability to consent to the study, and answers to basal questions, which was all collected via a study website.

Demographic Characteristics of the Populations

General Recruitment

According to the most recent data of Internet use by the U.S. Census Bureau in 2009, 68.7% of all households in the United States have Internet access within the home. African Americans (54.5%) and Hispanics (52.8%) have lower levels of Internet connectivity in the home, where as Caucasians (70.5%) and Asian Americans (80.5%) have higher levels of connectivity. Additionally, individuals less than 55 years old are more likely to have access to the Internet at home (ranging from 67.0% to 77.8%) where as those who are 55 or older show decreased levels of connectivity (58.2%). Finally, as education increases, the likelihood of home Internet connectivity increases with less than high school education having the lowest (32.2%), followed by high school graduate (57.5%), some college (74.7%), and reaching the highest levels with completion of a college degree (88.5%; U.S. Census Bureau, 2010).

Instrumentation

Demographics

Participants were administered a specific questionnaire to determine their demographic characteristics (see Appendix A), and targeted for the population being studied. The questionnaire asked specific questions regarding the participant's ethnicity (e.g., Caucasian, African American, Hispanic, Asian/Pacific Islander, Multiracial). Furthermore, it asked questions regarding the participant's age, year in school, student status, years of college, gender, and race. Finally, it asked participants if they have been diagnosed with a chronic medical or psychiatric disorder.

Measures of Emotional Expression

The following measures were used to evaluate the participants' trait emotional expression (i.e., BEQ, CECS), emotional state after writing (i.e., SAM), and amount of emotional expression used in their writing (i.e., LIWC).

Berkeley Expressivity Questionnaire

The BEQ is a 16-item self-reporting measure assessing individual's trait emotional expressivity (see Appendix B). Participants were asked to report their agreement on a scale from 1 (strongly disagree) to 7 (strongly agree). Results yield a total scale score in addition to three subscales (positive expressivity, negative expressivity, and impulse strength). Studies of this measure have demonstrated an internal consistency between 0.82-0.85, with the subscale ranging between 0.71 to 0.76. Additionally, this measure has an interpretable factor structure, and reliable test-retest reliability (Gross & John, 1995, 1997). The factor structure has been confirmed through exploratory (Gross & John, 1995, 1997) as well as confirmatory factor analysis (Gross & John, 1997). The BEQ shows consistent convergent validity with other measures of positive and negative emotional expression (e.g., Positive Affect Negative Affect Scale [PANAS]), and is related to behavioral observations of emotional expression (Gross & John, 1997).

Courtauld Emotional Control Scale

The CESE was derived from clinical interviews with cancer patients; 48 questions were originally created from these interviews and then administered to a heterogeneous sample. This questionnaire is intended to measure control over trait negative emotional

reactions and consists of three subscales, which were upheld through factor analysis. The subscales focus on anger, anxiety, and depression. Each subscale contains seven items with responses ranging from “1” (almost never) to “4” (almost always). The subscales have internal consistencies ranging from 0.86 to 0.88 for each subscale and test-retest correlations ranging from 0.84 to 0.89 (Watson & Greer, 1983). The questions on this subscale can be found in Appendix C.

Self-Assessment Manikin

The SAM is a non-verbal pictorial instrument that measures pleasure, arousal, and dominance associated with a person’s affective reaction to a stimulus (see Appendix D). Each dimension is measured on a 9-point scale from 1 (e.g., very calm) to 9 (e.g., very aroused). SAM pleasure and arousal scores correlate highly with semantic differential scores for both measures (Bradley & Lang, 1994).

Linguistic Inquiry and Word Count

LIWC is a text analysis program designed to calculate the frequency of specific words and categorize these words. The present study focused upon emotion words and measures the amount of emotional expression (both positive and negative) in a given essay (Pennebaker, et al., 2001). LIWC scans text files that result in a percentage score based on how many words fit into a category versus the total word count. Bantum and Owen (2009) confirmed LIWC to be a valid instrument for identifying emotional expression in linguistic data. LIWC has good content validity when compared to human raters (Alpers, et al., 2005). A Perl-based replication of the original LIWC program will

be used in the present study. This adaptation results in an almost identical replication of emotional expression as the original LIWC program (Owen, et al., 2011). For all the analyses involving LIWC, the emotional word count as a percentage of total words will be utilized in order for their total word count to be included as a covariate.

Essay Evaluation Questionnaire

The EEQ measures the extent to which an individual's essays were personal, meaningful, and emotionally revealing; as well as the extent to which they wanted to talk about, held back from talking about, and actually talked with others about their essays (see Appendix E). The EEQ is measured on a 7-point scale from 1 (not at all) to 7 (a great deal). Presently there are no known studies that document this specific scale and its psychometrics; however, it has been used in previous research (see M. A. Greenberg & Stone, 1992; Schwartz & Dorotar, 2004).

Measurement of Physical Health

To measure the participants' physical health they were given a measure of common physical symptoms (PILL) and were asked about the number of times they visited the student health center or a private doctor, how many days they had been sick, and the number of days their activity had been restricted in the past four weeks (see Appendix F). Participants' self-reporting may be less conclusive if it is less invasive of the participants' privacy, and can provide an inaccurate estimate of their health.

Pennebaker Inventory of Limbic Languidness.

The PILL is a 54-item scale assessing the frequency of a group of common physical sensations and symptoms (see Appendix F). Individuals were asked to rate each of their symptoms from A (Have never or almost never experienced the symptom) to E (More than once every week). Two methods of scoring for the PILL exist. One consists of summing the total number of items scored as C, D, or E. The second method consists of summing the total of all responses. Both methods were utilized in the data analysis phase of this dissertation. Internal consistencies for this measure range from 0.88 to 0.91 with a test-retest reliability ranging from 0.79 to 0.83 (Pennebaker, 1982).

Measurement of Mental Health

To measure the participants' mental health, participants were given a measure of trauma symptoms (PCL) and a measure of general distress (OQ-45.2).

PTSD Checklist

The PCL is a 17-item self-report measure of the DSM-IV symptoms of PTSD, which can be used to screen, diagnose, and monitor PTSD symptoms before, during, and after treatment (see Appendix G). Participants were asked to report symptoms on a scale from 1 (not at all) to 5 (extremely). Results yield a total symptom severity score. Three versions of the PCL exist: unspecified military (M) or civilian (C) stressor and specific (S) version with the stressor specified by the participant. The specific version (PCL-S) was used in the current study, out of respect for the study's aim to reduce distress surrounding a specific stressor through expressive writing. The PCL has a test-retest

correlation of 0.87 with an internal consistency of 0.91. It shows convergent validity with other measures of PTSD symptoms (DSM and Non-DSM correspondent) with correlations ranging from 0.62 to 0.75. It showed appropriate discriminate validity with measures of depression and anxiety, with correlations ranging from 0.34 to 0.63. The PCL provides a suitable clinical cutoff associated with the diagnosis of PTSD. Finally, this measure is appropriate for assessing PTSD (Adkins, Weathers, McDevitt-Murphy, & Daniels, 2008).

Outcome Questionnaire 45.2

The OQ-45 is a 45-item scale measuring distress that has been shown to be sensitive to change in therapeutic settings (see Appendix H). Individuals rate each item on a scale from 0 (never) to 4 (almost always), which results in a total symptom score. While the OQ-45 does have three subscales, they will not be interpreted due to their limited applicability, resulting in their factor structure not holding up under factor analysis (Kim, Beretvas, & Sherry, 2010). However, the total score has been demonstrated to have an internal consistency around 0.93 with test-retest correlations around 0.84. Regarding the measures' convergent validity, the OQ-45 total score correlates highly (0.44-0.92) with other measures of psychopathology. A clinical cut-off of 63 can be used to differentiate between community and clinical populations (Lambert, 2004). This measure shows an appropriate sensitivity to change in regards patients receiving psychotherapy (Vermeersch, Lambert, & Burlingame, 2000)

Intervention Groups

Participants were randomly assigned to one of five intervention treatment groups for the entire study. Experimental procedures are discussed in more detail below.

Control Group

Participants assigned to this group were asked to write about the things they did yesterday, today, and what they plan do for the rest of the day after they finish the writing exercise (see Appendix I).

Standard Linguistic Writing Instructions

Participants were asked to write about their deepest thoughts and feelings regarding a specific traumatic or stressful event (see Appendix J). Only general instructions were given each day during the study.

Emotion Focused Self-Report Feedback

Participants were given the Standard Linguistic Writing Instruction on the first day. However, on subsequent days, they were given feedback based on their self-reported measures of emotional expression. This included focusing on negative emotional expression for the second day and positive emotional expression on the final day of writing (see Appendix K).

Table 1

BEQ scores derived from Owen et al., (2011) sample and CESC derived from Owen et al., (Unpublished manuscript).

	BEQ			CESC			
	Total	Positive	Negative	Total	Anger	Anxiety	Sadness
N	240	240	240	135	135	135	135
# of items	16	4	6	21	7	7	7
Mean	4.61	5.61	3.95	54.59	17.00	18.69	18.89
Median	4.56	5.75	3.83	55.00	17.00	19.00	19.00
Mode	5.00	6.50	3.83	59	14.00	16.00	15.00
SD	0.89	1.01	0.93	12.33	4.75	4.77	4.93
Alpha	0.85	0.76	0.58	0.82	0.70	0.25	0.80
Skewness	0.03	-0.82	0.30	0.06	0.14	0.03	0.11
Kurtosis	-0.25	0.68	0.14	-0.66	-0.80	-0.84	-0.80
25%ile	4.00	5.00	3.33	45.00	13.00	15.00	15.00
75%ile	5.19	6.50	4.50	63.00	21.00	22.75	22.00

Self-Report Feedback Procedures

Similarly to LIWC feedback, no study has documented specific cut-off scores on emotional self-report measures that correspond to health and mental health benefits. Furthermore, this study is the first study to use self-report measures as feedback to increase emotional expression in a writing paradigm. Therefore, specific cut points for the BEQ, as well as positive and negative sub scales of the BEQ, are not available. The present study classified high and low trait expressivity using the 25th and 75th percentiles for the same rationale as the LIWC feedback. The BEQ scores that correspond to the 25th and 75th percentiles can be found in Table 1. The 0-25th percentiles were classified as having to "struggle with" total emotional expression (BEQ). Percentiles 25-75 were classified as "able to express" total emotional expression (BEQ). Finally, percentiles 75-100 were classified as being able to "easily express" total emotional expression (BEQ).

Self-Report Feedback 1

For the first feedback, to classify the ease with which individuals were able to express their negative emotions, their average total trait expression was compared with their negative expression. This was done by comparing their classification groups of total and negative expressivity. If their expressivity groups were the same, they were considered to have "a similar experience" expressing negative emotion. If their negative expression was higher or lower than their total expressivity, then they were considered to have "an easier time" or "a harder time" expressing their emotions respectfully. Additionally, their score on the CESC was calculated for each of the subscales (anger, anxiety/fear, sadness/depression) and they were given feedback based on their highest subscale. However, if they have equally high scores on two or more subscales, then they are given a message to that effect. Participants were given instructions based on emotion-focused therapy (Elliott, et al., 2004) in order to increase their emotion as they continue to write.

Self-Report Feedback 2

For the second feedback report, participants were first given a reminder regarding their total expressivity, similar to the previous feedback. Additionally, their percentile rank classifications placed participants into nine categories (e.g., High Positive & High Negative, Average Positive & Low Negative, etc.) based on their self-reported positive and negative expressivity. They were given feedback based on these classifications. The feedback messages can be found in Appendix K.

Emotion Focused LIWC Feedback

Participants were given the Standard Linguistic Writing Instruction for the first day. However, on subsequent days, they were given feedback based on their previous day's writing, based on the LIWC emotional expression scores derived from their writing (see Appendix L). Similarly with the self-report feedback condition, the second day focused on negative emotional expression and then positive emotional expression on the final day of writing.

Table 2

First writing LIWC word count distributions taken from Owen, et al. (2011).

	Positive	Negative	Anxiety	Anger	Sadness
N	240	240	240	240	240
Mean	1.98	2.43	0.41	0.65	0.75
Median	1.86	2.31	0.26	0.50	0.65
Mode	1.60	1.70	0.00	0.00	0.00
SD	0.95	1.08	0.43	0.63	0.61
Skewness	0.78	0.767	1.92	1.71	1.40
Kurtosis	0.87	0.572	5.17	5.34	2.40
Minimum	0.18	0.36	0.00	0.00	0.00
Maximum	5.54	6.32	2.70	4.43	3.24
25%ile	1.32	1.66	0.13	0.18	0.29
75%ile	2.48	3.04	0.57	0.96	1.02

LIWC Feedback Procedures

There has not been a study documenting specific emotional word count cutoffs associated with health and mental health benefits. In our previous paper (Owen et al., 2011), we used the +/- 1.285 z-score based on Pennebaker, et al., (2001; positive emotional expression: $m = 2.7$, $sd = 1.6$; negative expression; $m = 2.6$, $sd = 1.7$), which we assumed would be a normal distribution and then about 10% of our sample

would show high and low expressivity. However, upon analysis, it was found that our distributions for both positive ($m = 1.98$, $sd = 0.95$) and negative ($m = 2.43$, $sd = 1.08$) expressivity were positively skewed. Of those individuals who completed the first writing session ($n = 240$), 1.4% (3.5%) and 66.8% (44.5%) were classified as having high and low positive (negative) expressivity, respectively. Given this skew, we found an increase in the number of individuals classified as low, and a decrease in the number of individuals being classified as average or high. The dataset from Owen, et al. (2011) was generated from a sample taken of college students. This sample was a convenience sample likely to be similar with regards to distribution; therefore, specific cut points can be determined from this distribution to give better estimates of this population than those provided by Pennebaker, et al. (2001). Additionally, having access to this data set allows for the determination of percentile ranks associated with this skewed distribution, this will provide better classification estimates than z-score cutoffs, which assume a normal distribution.

The present study takes a more liberal approach to classifying individuals as having high and low expressivity, using the percentiles associated with the 25th and 75th percentiles. The word count cutoffs associated with these percentiles can be found in Table 2. The 25th and 75th percentiles were chosen due to their associated change in interpretation (e.g., <25th percentile = low average, >75th percentile = high average) within the Wechsler classification ranges (Horton, 2007). Percentiles 0-25 were classified as having "few" positive or negative emotional words used in their writing. Percentiles 25-75 were classified as having "a fair number" of positive or negative emotion words used. Finally, percentiles 75-100 were classified as having used "many" positive or

negative emotion words during the session. If no positive or negative words were used during the writing session, then a specific message to this effect was given.

LIWC Feedback 1

For the first feedback, in order to determine which negative emotion was expressed most frequently by an individual, the word count for each negative emotion (anxiety, anger, & sadness) was calculated (and they were all above 0); the highest emotional word count category was then determined and participants were given a message based upon that emotional category. If they have more than one highest emotional word count category, then they were given a message to that effect. Participants were given instructions based on emotion-focused therapy (Elliott, et al., 2004) in order to increase their emotion as they continued to write.

LIWC Feedback 2

For the second feedback, participants were given feedback if they continued to stay at zero negative emotional expression, if their negative emotional expression increased or decreased between writing sessions one and two. Then, the negative emotional word count categories for both writing session 1 and 2 were calculated for each negative emotion (anxiety, anger, & sadness); the highest emotional word count category (over both days) was determined and participants were given a message based upon that emotional category. Similarly, if they had more than one highest emotional word count category (i.e., if their word counts for two or more categories were similar to each other) then they were given a message to that effect. Additionally, participants were given

feedback based on the amount of positive emotional words used (as outlined above) for both writing sessions, and how their positive word count compared with their negative word count. Again, participants were given instructions based on emotion-focused therapy (Elliott, et al., 2004) in order to increase their emotion as they continue to write. The feedback messages can be found in Appendix L.

Emotion Focused Therapist Feedback

Participants were given the Standard Linguistic Writing Instruction on the first day. However, on subsequent days, they were given feedback from one of the researchers regarding what they had written the previous day (see Appendix M). The researcher gave feedback based on a weekly schedule and would provide the same individual feedback on subsequent days. Similar to the other feedback conditions (e.g., self-report & LIWC feedback), the second day focused on negative emotional expression and then positive emotional expression on the final day of writing.

Therapist Feedback Procedures

As mentioned above, a trained therapist delivered feedback to participants with this condition. This feedback is based on emotion-focused therapy with the aim of deepening the clients' emotional experience, which shall in turn increase the clients' expression of emotion. This feedback closely follows Elliott et al.'s (2004) Emotion Focused / Process Experiential therapy manual (Elliott, et al., 2004). Specifically, the therapist would first be attuned to the problematic experience that the participant is writing about. Once the experience is identified, the therapist may attempt to explore a

different aspect of the participant's experience, which may include one or more of the following deepening exercises: directing the participant to their internal experience and their feelings and reactions; helping the participant re-experience the emotions they felt during the stressful or traumatic event in order for them to become in tune with their emotions through the use of imagery; or directing the participant to the edges of their experience where the ambiguities arise, which might be areas of confusion, troubling thoughts, or things that are still unclear. In addition, the therapist might ask the participant to work on differentiating their emotional experiences to better understand what they were feeling or are feeling as they write. Finally, the therapist may help them to elaborate on their emotional experiences by writing what their emotions are about, or where in their body they feel their emotions, as well as having them symbolize their emotional turmoil, or focus on missing needs or actions. These steps allow the participant to move towards the resolution of their emotional experience. However, it is important to note that the resolution may be different. This could be due to new emotions (either positive or negative) surrounding the experience or a clarity surrounding the experience. They may even leave this experience unfinished and move on to something else (Elliott, et al., 2004).

The idea was to help the participant move deeper into their emotional and cognitive involvement within the therapeutic context of their writing. This involvement has been set in seven stages as outlined in Table 8 (see discussion). As with the other feedback conditions, this feedback was administered twice by the same therapist. Examples and instructions given to the therapist can be found in Appendix M.

Procedures

Recruitment

Recruitment took place through facebook groups, yahoo groups, google groups, Craig's List and other publically-identifiable listservs & forums with the following advertisement:

Are you interested in participating in research to improve the lives of those who have suffered a stressful or traumatic event? If so, please go to <http://expressyourself.cancri.net> to find out more about the study. If you should decide to participate, you would be randomized to one of five different conditions and would be asked to write for 20 minutes a day on 3 consecutive days of your choice about a previous traumatic event. You would also be asked to complete a brief online questionnaire before starting to write and after a brief period after completion of your 3 days of writing. Those who complete the study will be eligible to receive a \$10 gift card to Amazon.com

Participants must have been at least 18 years old and fluent in English as well as having access to the Internet. The aim was to recruit between 300-500 participants. However, at the time of data analysis for this dissertation, only 26 participants had complete data (see results section below).

Screening

Potential participants were screened with the PCL to assess for clinical and subclinical levels of PTSD. If participants met the minimum symptom criteria for inclusion in the study (PCL > 17), they were eligible to consent for the study (see Appendix N). If participants did not meet the minimum symptom criteria for inclusion in the study (PCL < 17) a message will inform them that they were not eligible for the study and the program would not allow them to re-register for the study. If participants reach a the threshold of 50 (as identified by Blanchard, et al., 1996), which is suggestive of

positive diagnosis of PTSD, then our computer program gave them the following message with the choice of quitting or continuing on with the study.

You just completed a screening instrument aimed to measure the distress caused by a traumatic event. On this scale, you identified that the traumatic event you have experienced is causing you substantial distress. It is our obligation to inform you that a therapist (to find a therapist: <http://locator.apa.org/>) might be better suited to address the symptoms associated with your traumatic memories. You may continue to engage in our writing study regardless of your decision to attend or not attend therapy.

Measurement

The study and website will follow the flow sheet found in Appendix O. After participants consented to be surveyed, they completed the following baseline measures: the Pennebaker Inventory of Limbic Languidness (PILL), the Berkeley Expressivity Questionnaire (BEQ), Courtauld Emotional Control Scale (CESE), the Outcome Questionnaire 45.2 (OQ-45.2), and demographics that include the number of visits to a mental or physical health provider in the last four weeks (see Appendix A, B, C, F, G, & H). They were randomly assigned to one of five conditions (as discussed above). Four of the groups received the standard linguistic writing instructions (as noted above) and the control group received the control instructions (as noted above). The participants were given instructions, based upon their experimental condition to write for twenty minutes, three days in a row. They were instructed to type for the full twenty minutes, and not to worry about grammar or spelling. The participants were instructed to find a quiet and isolated place where they can write in peace. After the participant finished their writing, they completed the Self-Assessment Manikin (SAM; see Appendix D).

Administration of Feedback

The participants were prompted by email regarding when they can return to the website to resume the experiment. Participants cannot rejoin the website for at least 15 hours after completing the initial writing (and subsequent writing), and have up to 36 hours from completing the previous writing to continue writing before becoming ineligible for the study. Before the second (and third) writing session, participants were given feedback based on their previous writing for three of the experimental conditions (Self-Report Feedback, LIWC Feedback, and Therapist Feedback). All participants were prompted if they did not write for at least 20 minutes to continue writing. All participants completed the second day of writing and completed the SAM. The third day of writing functioned similarly to the second day of writing. Upon completion of the third day of writing, participants were eligible for a \$5.00 gift card to Amazon.com. The following message was emailed to participants with their gift card:

Thank you for participating in our writing study. Below, you will find an Amazon.com electronic gift certificate code that is valid for \$5.00. Please come back in 30 days to complete our follow-up survey, which should take no more than a few minutes to complete, and earn another gift certificate. Thank you!

Follow-up Procedures

Participants received an e-mail reminder after four weeks regarding follow-up measures. After four weeks, participants completed the following measures: PTSD Checklist (PCL), the Pennebaker Inventory of Limbic Languidness (PILL), the Berkeley Expressivity Questionnaire (BEQ), Courtauld Emotional Control Scale (CESE), Essay Evaluation Questionnaire (EEQ), the Outcome Questionnaire 45.2 (OQ-45), and number

of visits to a health provider in the last four weeks (see Appendix A, B, C, E, F, G, & H). After we obtained our results, we debriefed the participant (see for debriefing statement see Appendix P) and offered them compensation as a \$10.00 gift card to Amazon.com.

The following message was emailed to participants with their gift card:

Thank you for participating in our writing study. Below, you will find an Amazon.com electronic gift certificate code that is valid for \$10.00. Thank you!

Compensation

Participants were eligible for a \$5 gift card compensation after they had finished the follow-up measures on the third day, and a \$10 gift card compensation after they had completed the follow-up measures. Participants received up to \$15 in gift cards for their time.

Evaluation of the Essays

Linguistic Inquiry and Word Count (LIWC) software will be used on all writing samples to determine whether there is any change in the amount of emotional language used. The LIWC software gives both the total, positive, and negative emotional expression utilized within each writing sample.

Data Analysis Procedures

Statistical Analysis

SPSS 17.0 for Windows (SPSS Inc., 2008) was used to run all analyses with a two-tailed test of significant with an alpha of 0.05. All data was cleaned and screened; individuals with missing data will be excluded for all analyses. Specifically, to assess for

normality, linearity, and presence of outliers of univariate predictors, descriptive statistics and histograms were utilized. Bivariate scatterplots of the variables were run to assess for multivariate linearity and normality. Since this data analysis was done on preliminary data, nothing was done to correct for absence of normality, linearity, or presence of outliers. However, since violations of the assumption of homogeneity of variance could be assessed and corrected, the Levene's test of the equality of error variances was used. Additionally, Mauchly's test for the assumption of sphericity was used for all Repeated Measures ANOVAs and if it was significant, the degrees of freedom were corrected by the Greenhouse-Geisser or Huynh-Feldt corrections (Field, 2009). Dunn's Bonferroni correction method was used for all post hoc follow up analyses of group differences and to help control type I error. Additionally, the effect size η^2 (Eta squared) was calculated for all repeated measures analyses. Cutoffs for η^2 were converted from f^2 (Cohen, 1988) then converted using the following formula $\eta^2 = \frac{f^2}{(f^2+1)}$ which was mathematically derived from $f^2 = \frac{\eta^2}{(1-\eta^2)}$ and the following effect sizes classifications were used: Small ($\eta^2 = 0.0196$), Medium ($\eta^2 = 0.1304$), and Large ($\eta^2 = 0.2592$).

Aim 1: To replicate previous research findings that emotional expression positively affects mental and physical health. A specific a priori planned comparisons were used for this aim to demonstrate replication of previous research.

- **Hypothesis 1.1:** The individuals who received the standard linguistic writing instructions (group 2) will have decreased physical health symptoms upon follow-up as compared to the control instructions (group 1). To test hypothesis 1.1, a 2 (time) x 2 (group) repeated measures ANOVA will be used to compare

those who received the standard writing instructions (group 2) versus the control group (group 1) on the PILL.

- **Hypothesis 1.2:** The individuals who receive the standard linguistic writing instructions (group 2) will have decreased levels of distress upon follow-up as compared to the control instructions (group 1). To test hypothesis 1.2, a 2 (time) x 2 (group) repeated measures ANOVA will be used to compare those who received the standard writing instructions (group 2) on the OQ-45.2.
- **Hypothesis 1.3:** The individuals who receive the standard linguistic writing instructions (group 2) will have decreased symptoms of PTSD upon follow-up as compared to the control instructions (group 1). To test hypothesis 1.3, a 2 (time) x 2 (group) repeated measures ANOVA will be used to compare those who received the standard writing instructions (group 2) on the PCL.
- **Hypothesis 1.4:** The individuals who receive the standard linguistic writing instructions (group 2) will have decreased use of healthcare services upon follow-up as compared to the control instructions (group 1). To test hypothesis 1.5, a 2 (time) x 2 (group) repeated measures ANOVA will be used to compare those who received the standard writing instructions (group 2) on the number of visits to healthcare services.

Aim 2: To determine if feedback changes the amount of emotional language used in writing.

- **Hypothesis 2.1:** Individuals in the control group will have the lowest amount of total emotional expression and individuals who receive tailoring (groups 3-5) will have increased expressive over the standard linguistic writing instructions

(group 2) or control instructions (group 1). To test hypothesis 2.1, three 3 (time) x 5 (group) repeated measures ANOVA will compare LIWC total emotional expression between the five experimental conditions. The bonferroni correction method will be used to identify group differences.

- **Hypothesis 2.2:** Individuals in the control group will have the lowest amount of negative emotional expression and individuals who receive tailoring (groups 3-5) will have increased expressive over the standard linguistic writing instructions (group 2) or control instructions (group 1). To test hypothesis 2.2, a 3 (time) x 5 (group) repeated measures ANOVA will compare LIWC negative emotional expression between the five experimental conditions. The bonferroni correction method will be used to identify group differences.

- **Hypothesis 2.3:** Individuals in the control group will have the lowest amount of positive emotional expression and individuals who receive tailoring (groups 3-5) will have increased expressive over the standard linguistic writing instructions (group 2) or control instructions (group 1). To test hypothesis 2.1, three 3 (time) x 5 (group) repeated measures ANOVA will compare LIWC positive emotional expression between the five experimental conditions. The bonferroni correction method will be used to identify group differences.

Aim 3: To determine if feedback on emotional expression enhances mental and physical health over previous emotional expression writing paradigms.

- **Hypothesis 3.1:** The individuals who receive tailoring (groups 3-5) will have decreased physical health symptoms upon follow-up as compared to the standard linguistic writing instructions (group 2) or control instructions (group

- 1). To test hypothesis 3.1, a 2 (time) x 5 (group) repeated measures ANOVA will be used to compare those who received the feedback (groups 3-5) versus those groups who did not (groups 1-2) on the PILL. The bonferroni correction method will be used to identify group differences.
- **Hypothesis 3.2:** The individuals who receive tailoring (groups 3-5) will have decreased levels of distress upon follow-up as compared to the standard linguistic writing instructions (group 2) or control instructions (group 1). To test hypothesis 3.2, a 2 (time) x 5 (group) repeated measures ANOVA will be used to compare those who received the feedback (groups 3-5) versus those groups who did not (groups 1-2) on the OQ-45.2. The bonferroni correction method will be used to identify group differences.
 - **Hypothesis 3.3:** The individuals who receive tailoring (groups 3-5) will have decreased symptoms of PTSD upon follow-up as compared to the standard linguistic writing instructions (group 2) or control instructions (group 1). To test hypothesis 3.3, a 2 (time) x 5 (group) repeated measures ANOVA will be used to compare those who received the feedback (groups 3-5) versus those groups who did not (groups 1-2) on the PCL. The bonferroni correction method will be used to identify group differences.
 - **Hypothesis 3.4:** The individuals who receive tailoring (groups 3-5) will have decreased use of healthcare services upon follow-up as compared to the standard linguistic writing instructions (group 2) or control instructions (group 1). To test hypothesis 3.5, a 2 (time) x 5 (group) repeated measures ANOVA will be used to compare those who received the feedback (groups 3-5) versus

those groups who did not (groups 1-2) on the on the number of visits to healthcare services. The bonferroni correction method will be used to identify group differences.

CHAPTER THREE

RESULTS

Sample Characteristics

The sample of participants was based on the Internet recruiting campaign conducted between October 1, 2012 and January 3, 2013. Descriptive characteristics of the sample can be found in Table 3. Participants' flow through the experiment is outlined in Figure 2. As shown in the flow diagram, there were seven participants in the control condition, eight in the standard writing instructions condition, five in the LIWC feedback condition, six in the therapist feedback condition, and only one in the self-report feedback condition who completed the three days of writing and follow-up measures. Due to small sample size in the self-report feedback condition ($n = 1$), that condition was excluded from further analysis because there would not be sufficient degrees of freedom within the repeated measures analyses.

In examination of the four remaining groups, there were no significant demographic differences across groups with respect to gender $X^2(3, N = 26) = 6.21, p = 0.10$, ethnicity $X^2(9, N = 26) = 11.35, p = 0.25$, Hispanic ethnicity $X^2(3, N = 26) = 1.94, p = 0.59$, presence of a chronic illness $X^2(3, N = 26) = 2.45, p = 0.84$, having a mental disorder $X^2(3, N = 26) = 0.69, p = 0.88$, age $F(2,22) = 2.66, p = 0.07$, or education $F(2,22) = 0.90, p = 0.46$.

Baseline Characteristics

A flow chart tracking participants' progress through the study can be found in Figure 2. Baseline characteristics in each of the writing conditions, including self-report measures of emotional expressivity and psychological functioning, are shown in Table 4. Between-groups differences in linguistic aspects of time 1 writing are shown in Table 5.

Table 3

Descriptive Characteristics of the Sample (n = 26)

	Total <i>n</i> = 26 <i>N</i> (%)	Therapist <i>n</i> = 6 <i>N</i> (%)	LIWC <i>n</i> = 5 <i>N</i> (%)	Standard <i>n</i> = 8 <i>N</i> (%)	Control <i>n</i> = 7 <i>N</i> (%)
Gender					
Male	5 (19.2)	0 (0.0)	2 (7.7)	3 (11.5)	0 (0.0)
Female	21 (80.8)	6 (23.1)	3 (11.5)	5 (19.2)	7 (26.9)
Ethnicity					
Hispanic	2 (7.7)	1 (3.8)	0 (0.0)	1 (3.8)	0 (0.0)
Asian American	4 (15.4)	3 (11.5)	0 (0.0)	0 (0.0)	1 (3.8)
African American	2 (7.7)	0	0 (0.0)	1 (3.8)	1 (3.8)
Caucasian	19 (73.1)	3 (11.5)	5 (19.2)	6 (23.1)	5 (19.2)
Other	1 (3.8)	0	0 (0.0)	1 (3.8)	0 (0.0)
Chronic Illness					
No	15 (57.9)	5 (19.2)	3 (11.5)	4 (15.4)	3 (11.5)
Yes	11 (42.3)	1 (3.8)	2 (7.7)	4 (15.4)	4 (15.4)
Mental Disorder					
No	12 (46.2)	3 (11.5)	3 (11.5)	5 (19.2)	3 (11.5)
Yes	14 (53.8)	3 (11.5)	2 (7.7)	3 (11.5)	4 (15.4)
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Age	34.00 (2.47)	23.83 (4.58)	42.60 (16.95)	33.69 (10.42)	37.00 (12.17)
Education	15.85 (3.75)	16.33 (3.56)	13.60 (5.98)	15.75 (2.32)	17.14 (5.39)

Instrumentation at Baseline

In examining the baseline measures, no significant group differences were found for overall trait emotional expressivity $F(3, 22) = 0.81, p = 0.50$, positive emotional expressivity $F(3, 22) = 0.88, p = 0.46$, negative emotional expressivity $F(3, 22) = 0.69, p = 0.57$, or trait emotional impulse strength $F(3, 22) = 0.61, p = 0.61$. Furthermore, no

significant baseline differences were observed for trait negative emotional reaction $F(3, 22) = 2.94, p = 0.06$, trait anger subscale $F(3, 22) = 1.01, p = 0.41$, or trait depression subscale $F(3, 22) = 1.55, p = 0.23$. However, significant baseline differences within the sample were found for trait anxiety subscale, $F(3, 22) = 6.29, p = 0.003$ with significant between group differences for the therapist tailoring having a smaller baseline compared with the control ($p = 0.002$), standard instructions ($p = 0.028$), and neared significance with the LIWC tailoring instructions ($p = 0.051$). No other group differences were observed. No significant baseline differences between groups were found for total score of the physical health symptoms, $F(3, 22) = 0.56, p = 0.65$, number of symptoms $F(3, 22) = 0.32, p = 0.81$, number of days sick $F(3, 22) = 0.87, p = 0.47$, number of days restricted $F(3, 22) = 0.45, p = 0.72$, utilization of healthcare services $F(3, 22) = 1.67, p = 0.35$, or for OQ-45.2, $F(3, 22) = 1.17, p = 0.34$. Significant baseline differences within the sample were found for PTSD symptoms, $F(3, 22) = 5.21, p = 0.007$ with the therapist tailoring condition being significantly lower compared with the control ($p = 0.011$) and standard instructions ($p = 0.015$). No other group differences were observed.

Baseline Writing

In examining the baseline writing data, there were no significant differences between groups with regards to word count $F(3, 22) = 0.77, p = 0.52$, use of positive emotion words $F(3, 22) = 1.82, p = 0.17$, optimism words $F(3, 22) = 0.60, p = 0.62$, or anxiety words $F(3, 22) = 1.01, p = 0.41$.

However, some significant baseline differences were observed. These included total affect $F(3, 22) = 9.51, p = 0.001$ with significant between group differences found

where the control instructions were significantly lower than the standard instructions ($p = 0.001$); positive feelings $F(3, 22) = 4.13, p = 0.018$ with significant between group differences found with the control having lower than the standard instructions ($p = 0.015$); negative affect $F(3, 22) = 11.31, p = 0.001$ with significant group differences found between control instructions, which was significantly lower than the therapist feedback ($p = 0.045$), LIWC feedback ($p = 0.043$), or standard instructions ($p = 0.001$); anger negative emotionality $F(3, 22) = 4.04, p = 0.02$ with significant between group differences found with the control having lower than the standard instructions ($p = 0.015$); and finally, sadness negative emotionality $F(3, 22) = 4.31, p = 0.02$ with significant between group differences found with the control having lower than the standard instructions ($p = 0.014$).

Manipulation Check

It is important to note that these baseline differences observed within the writing are not unexpected. Specifically, those in the control group were given instructions that differed in comparison to the other three groups. The small sample size is likely restricting the differences in the other groups from the control instructions. What is important to note is that no significance differences were observed between those who received the standard writing instructions (i.e., standard instructions, LIWC Feedback, and Therapist Feedback) at baseline.

With respect to participants' immediate emotional responses to the first writing session, there were no between-group differences in arousal $F(3, 22) = 02.52, p = 0.09$, or dominance $F(3, 22) = 0.27, p = 0.85$. However, a significant differences were observed

for feelings of pleasure $F(3, 22) = 8.62, p = 0.001$. The control group reported experiencing more pleasure (e.g., happiness) than the trauma focused writing groups (p 's $< .01$).

Table 4

Instrument Baseline Characteristics of the Sample (n = 26)

Instruments	Total n = 26		Therapist n = 6		LIWC n = 5		Standard n = 8		Control n = 7		Medium	Mode	Skew	Kurtosis	Range	Alpha
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)								
BEQ	70.04 (17.51)	79.67 (13.82)	67.00 (7.40)	65.63 (15.68)	69.00 (22.83)	74.00	79.00	-0.68	-0.03	29-100	0.88					
Positive	20.73 (5.63)	24.00 (3.63)	19.20 (6.14)	19.88 (5.44)	20.00 (6.86)	22.00	24.00	-1.17	0.82	7-28	0.84					
Negative	19.88 (8.08)	23.00 (8.34)	16.80 (9.26)	18.25 (5.63)	21.29 (3.71)	21.00	26.00	-0.11	-1.06	6-34	0.84					
Impulse Strength	29.42 (8.10)	32.67 (5.09)	31.00 (9.03)	27.50 (9.10)	27.71 (8.92)	30.50	35.00	-0.75	-0.19	10-40	0.81					
CECS	60.69 (13.60)	48.50 (11.52)	66.20 (14.26)	60.88 (12.86)	67.00 (10.54)	61.50	37.00	-0.04	-0.90	37-84	0.85					
Sadness/Depression	20.65 (5.84)	16.67 (7.03)	22.80 (5.63)	20.50 (5.37)	22.71 (1.72)	21.50	20.00	-0.41	-1.02	9-28	0.25					
Anxiety/Worry	19.85 (4.60)	14.50 (3.39)	20.80 (4.92)	20.63 (2.97)	22.86 (1.28)	19.50	19.00	-0.14	-0.21	10-28	0.86					
Anger	20.19 (5.46)	17.33 (5.50)	22.60 (5.32)	19.75 (6.41)	21.43 (4.16)	20.00	26.00	-0.22	-1.24	11-28	0.67					
PILL	69.23 (29.24)	57.50 (23.62)	80.40 (36.49)	68.50 (36.27)	72.14 (20.59)	67.00	37.00	0.61	-0.91	35-124	0.92					
PILL Symptoms	20.65 (9.56)	17.50 (8.17)	22.80 (11.01)	20.50 (12.41)	22.00 (6.98)	19.50	11.00	0.55	-0.90	8-40	NA					
PILL # sick days	3.50 (5.76)	1.83 (2.86)	1.00 (1.41)	5.63 (9.40)	4.29 (3.55)	2.00	0.00	3.31	13.40	0-28	NA					
PILL # days restricted	3.19 (6.36)	1.67 (4.08)	1.20 (1.30)	4.63 (9.65)	4.29 (5.94)	0.50	0.00	2.92	9.33	0-28	NA					
Health Care Visits	0.88 (1.68)	0.17 (0.41)	0.60 (0.89)	1.75 (2.77)	0.71 (0.76)	0.00	0.00	3.32	13.14	0-8	NA					
PCL-S	55.27 (16.74)	36.50 (12.36)	56.20 (8.23)	61.63 (17.25)	63.43 (12.75)	56.00	32.00	-0.42	-0.85	20-79	0.94					
OQ-45.2	73.35 (27.61)	56.50 (24.47)	78.20 (32.21)	83.38 (26.29)	72.86 (27.22)	74.00	31.00	0.62	-0.77	29-123	0.94					

Table 5

Linguistic characteristics and emotional responses associated with the first writing session (n = 26).

	Total n = 26		Therapist n = 6		LIWC n = 5		Standard n = 8		Control n = 7		Mode	Skew	Kurtosis	Range
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)						
Expressivity Time 1	670.31 (333.30)	746.67 (170.21)	728.60 (436.82)	519.38 (415.88)	735.71 (254.07)	80.00	-0.15	-0.78	80-1187					
Word Count	4.70 (2.63)	4.48 (1.10)	4.32 (1.36)	7.27 (2.87)	2.21 (0.83)	3.91	0.68	0.89	1-11					
Total Affect	2.56 (1.86)	2.56 (1.22)	2.68 (1.10)	4.27 (1.73)	0.53 (0.35)	2.22	0.65	-0.21	0-7					
Negative Affect	0.65 (0.86)	0.71 (0.66)	0.89 (1.26)	0.87 (1.03)	0.18 (0.15)	0.36	2.08	4.24	0-3					
Anxiety	0.90 (0.96)	0.79 (0.68)	0.76 (0.41)	1.67 (1.29)	0.22 (0.24)	0.64	1.77	3.47	0-4					
Anger	0.56 (0.54)	0.57 (0.27)	0.38 (0.34)	1.00 (0.73)	0.18 (0.17)	0.52	1.57	2.78	0-2					
Sadness	2.09 (1.28)	1.88 (0.72)	1.63 (0.73)	2.92 (1.86)	1.65 (0.81)	2.20	1.49	4.40	0-6					
Positive Affect	0.73 (0.67)	0.71 (0.29)	0.54 (0.44)	1.28 (0.90)	0.26 (0.28)	0.67	1.53	3.15	0-3					
Optimism	0.40 (0.38)	0.40 (0.30)	0.34 (0.38)	0.55 (0.44)	0.29 (0.40)	0.36	0.85	-0.26	0-1					
SAM														
Dominance	5.23 (1.99)	5.00 (2.10)	5.20 (2.05)	5.75 (2.52)	4.86 (1.86)	5.00	-0.65	0.44	1-9					
Arousal	6.00 (2.08)	6.00 (2.10)	4.40 (2.30)	5.75 (1.58)	7.43 (1.81)	5.50	-0.12	-0.94	2-9					
Pleasure	5.81 (2.14)	6.50 (1.38)	7.00 (1.58)	6.75 (1.67)	3.29 (1.50)	6.00	-0.50	-0.43	1-9					

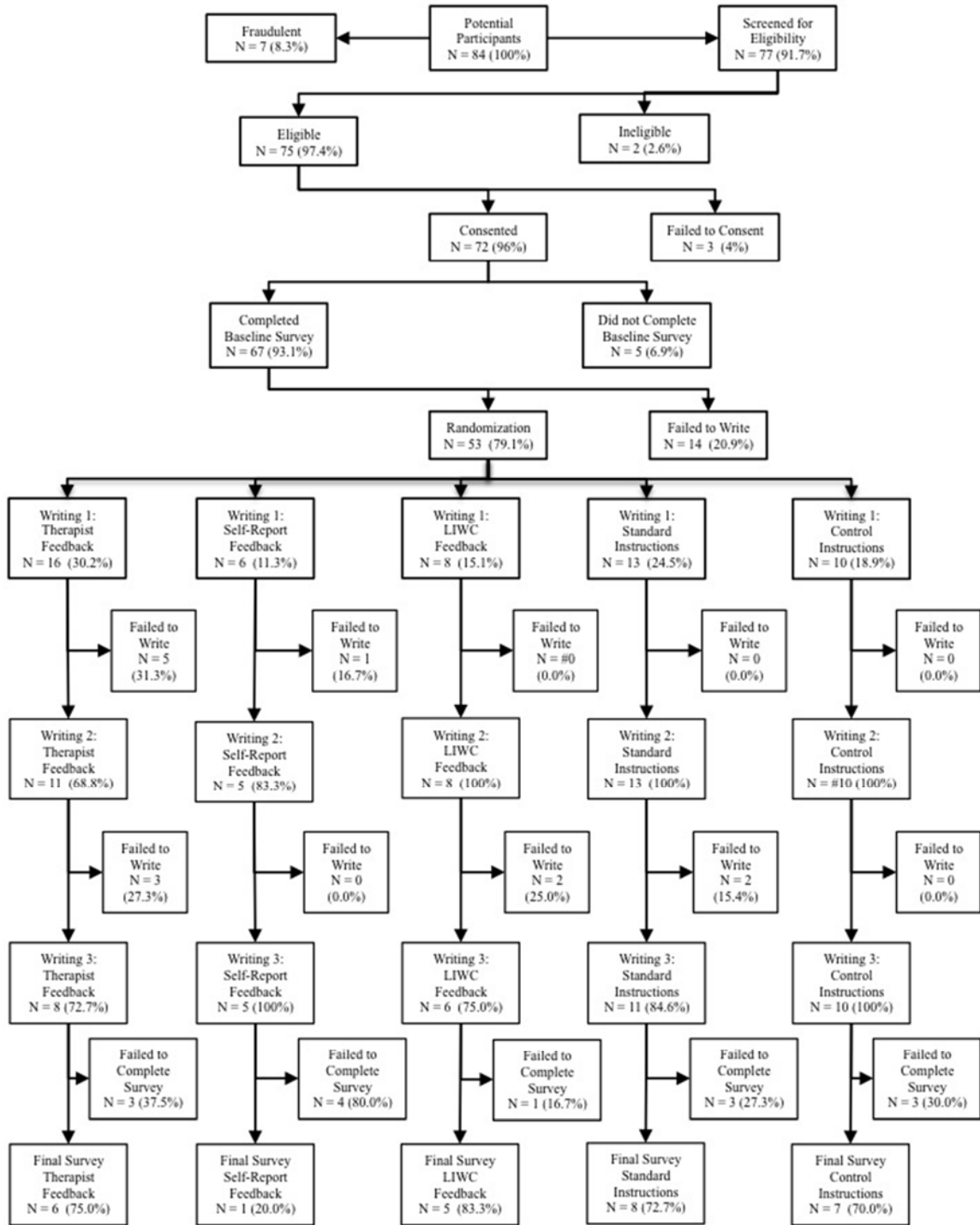


Figure 2: Participant Flow Chart through the Study.

Aim 1

The first aim was to replicate previous research findings that emotional expression positively affects mental and physical health using a priori planned comparisons between standard writing and control instructions. This aim was not supported.

Hypothesis 1.1

Hypothesis 1.1 was not supported and individuals who receive the standard linguistic writing instructions (group 2) had similar physical health symptoms upon follow-up as compared to the control instructions (group 1). The results of the 2 (time) x 2 (group) repeated measures ANOVA showed no between-group differences, $F(1, 13) = 0.387, p = 0.57, \eta^2 = 0.03$, small effect, between the standard writing instructions and the control group on total physical health. A graph of this finding can be seen in Figure 3 with the means and standard deviations found in Table 6.

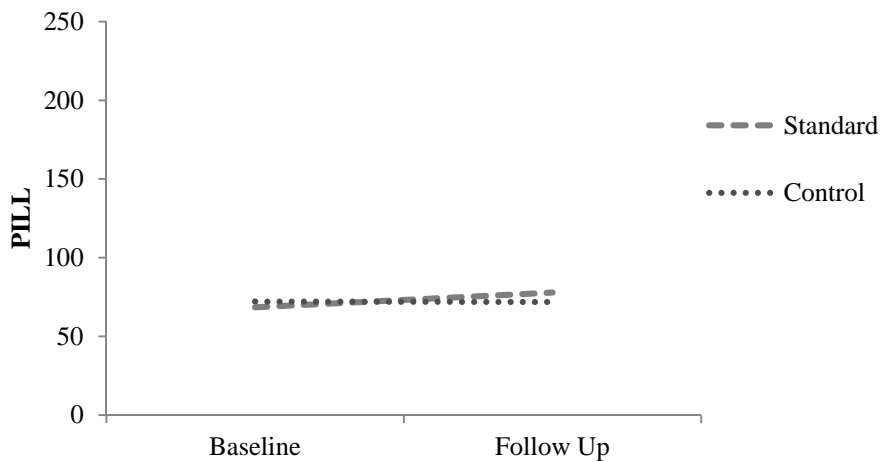


Figure 3: Group Differences between Standard and Control Groups on Physical Health as Measured by PILL.

In examining the total number of physical symptoms endorsed by the participants, the results of the 2 (time) x 2 (group) repeated measures ANOVA showed nonsignificant group differences, $F(1, 13) = 0.225, p = 0.64, \eta^2 = 0.017$, small effect, between the standard writing instructions and the control group. A graph of this finding can be seen in Figure 4 with the means and standard deviations found in Table 6.

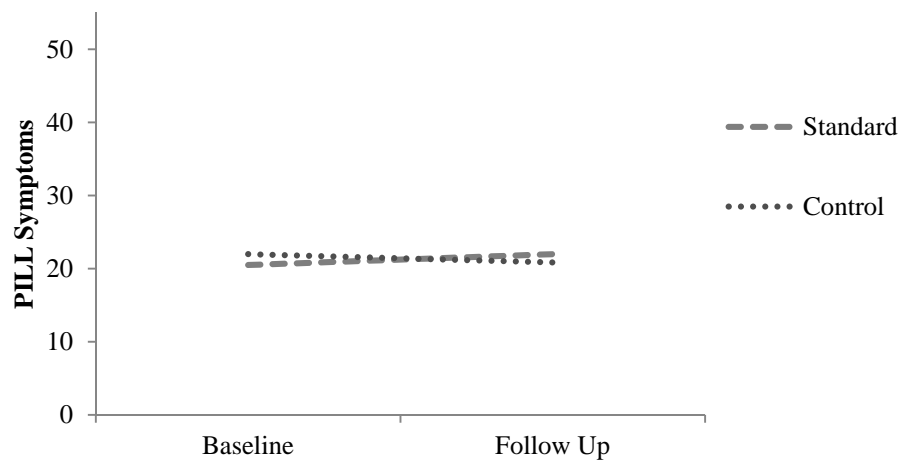


Figure 4: Group Differences between Standard and Control Groups on Physical Health as Measured by PILL Symptom Total.

The results of the 2 (time) x 2 (group) repeated measures ANOVA showed nonsignificant group differences, $F(1, 13) = 0.33, p = 0.58, \eta^2 = 0.025$, small effect, between the standard writing instructions and the control group on the total number of sick days taken in the last 30 days. A graph of this finding can be seen in Figure 5 with the means and standard deviations found in Table 6.

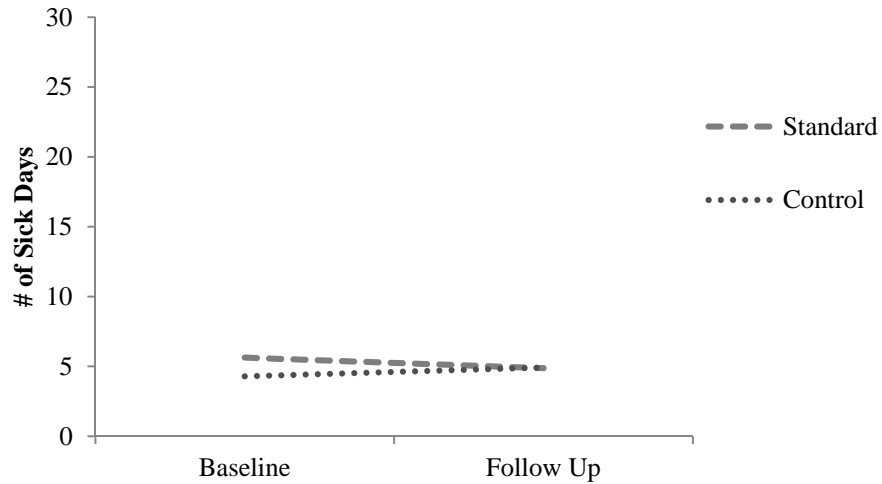


Figure 5: Group Differences between Standard and Control groups on Physical Health as Measured by # of Sick Days.

Finally, the results of the 2 (time) x 2 (group) repeated measures ANOVA showed nonsignificant group differences, $F(1, 13) = 0.067, p = 0.80, \eta^2 = 0.005$, very small effect, between the standard writing instructions and the control group on the total number of days restricted in the last 30 days. A graph of this finding can be seen in Figure 6 with the means and standard deviations found in Table 6.

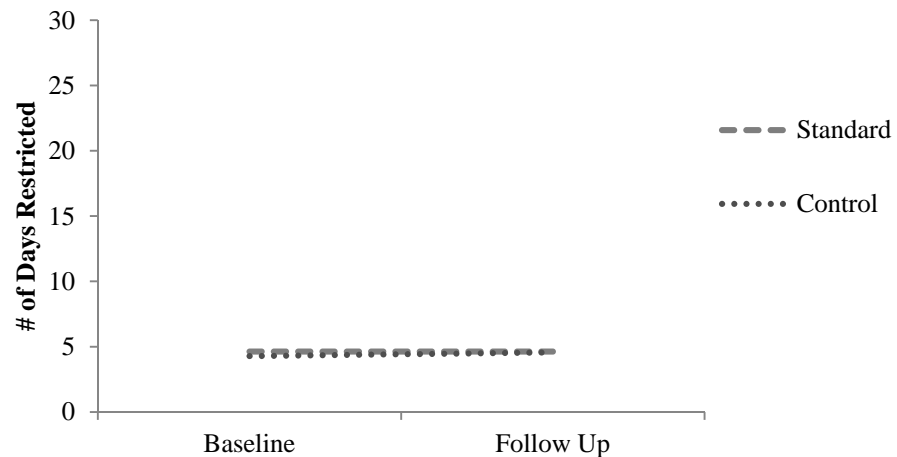


Figure 6: Group Differences between Standard and Control groups on Physical Health as Measured by # of Days Restricted.

Hypothesis 1.2

Hypothesis 1.2 was not supported and individuals who receive the standard linguistic writing instructions (group 2) similar levels of distress upon follow-up as compared to the control instructions (group 1). Thus, the results of the 2 (time) x 2 (group) repeated measures ANOVA showed nonsignificant group differences, $F(1, 13) = 0.739, p = 0.41, \eta^2 = 0.053$, small effect, between the standard writing instructions and the control group on the measure of psychological distress. A graph of this finding can be seen in Figure 7 with the means and standard deviations found in Table 6.

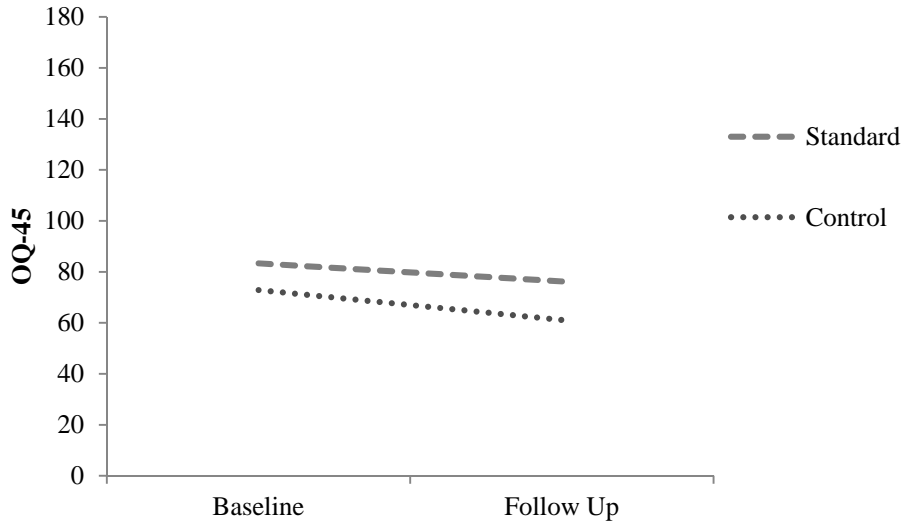


Figure 7: Group Differences between Standard and Control Groups on Psychological Distress as measured by the OQ-45.

Hypothesis 1.3

Hypothesis 1.3 was not supported and individuals who receive the standard linguistic writing instructions (group 2) similar levels of symptoms of PTSD upon follow-up as compared to the control instructions (group 1). Thus, the results of the 2 (time) x 2 (group) repeated measures ANOVA showed nonsignificant group differences,

$F(1, 13) = 0.244, p = 0.62, \eta^2 = 0.019$, small effect, between the standard writing instructions and the control group on the symptoms of PTSD. A graph of this finding can be seen in Figure 8 with the means and standard deviations found in Table 6.

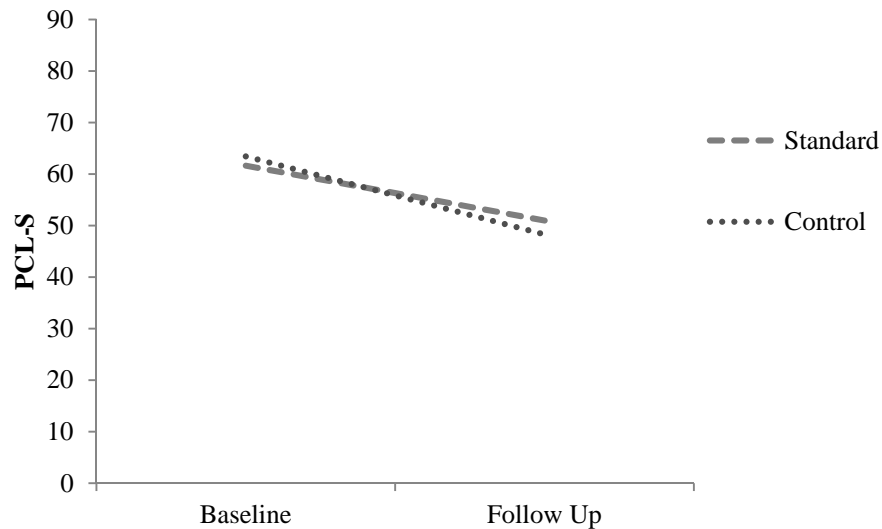


Figure 8: Group Differences between Standard and Control Groups on Symptoms of PTSD as measured by the PCL-S.

Hypothesis 1.4

Hypothesis 1.4 was not supported; the results of the 2 (time) x 2 (group) repeated measures ANOVA showed nonsignificant group differences, $F(1, 13) = 0.067, p = 0.80, \eta^2 = 0.005$, very small effect, between the standard writing instructions and the control group on number of healthcare visits within the last 30 days. A graph of this finding can be seen in Figure 9 with the means and standard deviations found in Table 6.

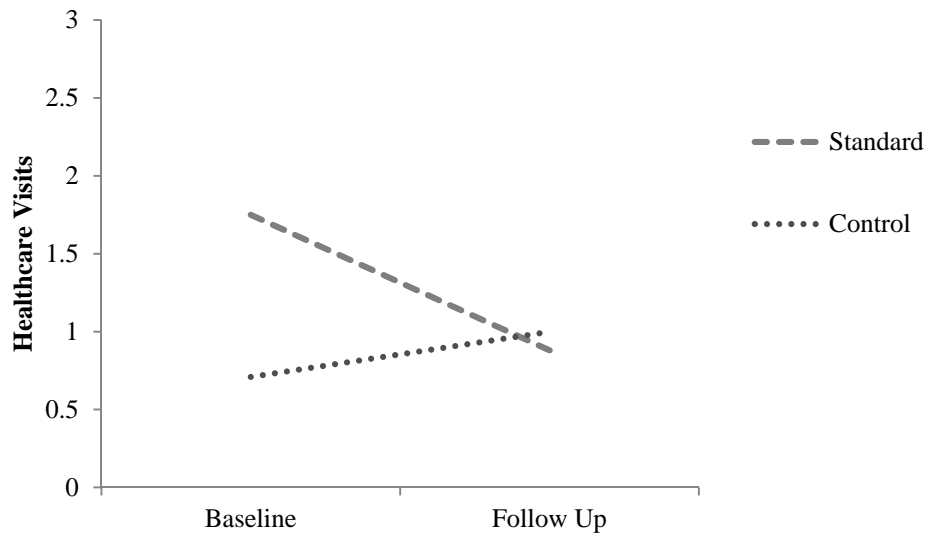


Figure 9: Group Differences between Standard and Control Groups on Health Care Utilization.

Table 6

Baseline measurement and follow-up assessment (n = 26)

	Total n = 26		Therapist n = 6		LIWC n = 5		Standard n = 8		Control n = 7	
	M (SD)		M (SD)		M (SD)		M (SD)		M (SD)	
Baseline										
PILL	69.23 (29.24)		57.50 (23.62)		80.40 (36.49)		68.50 (36.27)		72.14 (20.59)	
# of Symptoms	20.65 (9.56)		17.50 (8.17)		22.80 (11.01)		20.50 (12.41)		22.00 (6.98)	
# Sick days	3.50 (5.76)		1.83 (2.86)		1.00 (1.41)		5.63 (9.40)		4.29 (3.55)	
# days restricted	3.19 (6.36)		1.67 (4.08)		1.20 (1.30)		4.63 (9.65)		4.29 (5.94)	
OQ-45.2	73.35 (27.61)		56.50 (24.47)		78.20 (32.21)		83.38 (26.29)		72.86 (27.22)	
PCL-S	55.27 (16.74)		36.50 (12.36)		56.20 (8.23)		61.63 (17.25)		63.43 (12.75)	
HC Visits	0.88 (1.68)		0.17 (0.41)		0.60 (0.89)		1.75 (2.77)		0.71 (0.76)	
SAM Time 1										
Dominance	5.23 (1.99)		5.00 (2.10)		5.20 (2.05)		5.75 (2.52)		4.86 (1.86)	
Arousal	6.00 (2.08)		6.00 (2.10)		4.40 (2.30)		5.75 (1.58)		7.43 (1.81)	
Pleasure	5.81 (2.14)		6.50 (1.38)		7.00 (1.58)		6.75 (1.67)		3.29 (1.50)	
SAM Time 2										
Dominance	4.58 (2.00)		5.83 (2.04)		3.40 (1.67)		4.63 (2.07)		4.29 (1.89)	
Arousal	5.73 (1.97)		6.67 (2.07)		4.80 (1.48)		4.75 (2.25)		6.71 (1.11)	
Pleasure	6.08 (2.00)		6.33 (1.51)		7.40 (0.55)		6.50 (2.56)		4.43 (1.40)	
SAM Time 3										
Dominance	5.38 (2.43)		3.67 (1.03)		6.80 (2.28)		6.88 (2.03)		4.14 (2.48)	
Arousal	6.35 (2.06)		7.50 (1.64)		6.20 (1.92)		5.50 (1.69)		6.43 (2.70)	
Pleasure	5.31 (2.48)		6.67 (1.86)		5.00 (2.82)		5.00 (2.62)		4.71 (2.63)	
Follow Up										
PILL	80.85 (43.96)		72.33 (31.68)		107.00 (42.64)		77.88 (52.23)		71.86 (45.53)	
# of Symptoms	23.65 (13.92)		23.00 (10.56)		31.00 (14.68)		22.00 (16.50)		20.86 (13.95)	
# Sick days	5.19 (7.11)		3.67 (5.24)		8.80 (8.11)		4.88 (9.51)		4.92 (1.86)	
# days restricted	5.23 (7.07)		5.00 (5.29)		7.40 (8.47)		4.63 (9.55)		4.57 (5.09)	
OQ-45.2	68.15 (30.83)		54.33 (14.90)		81.60 (42.40)		76.25 (27.64)		61.14 (34.61)	
PCL-S	46.88 (18.34)		35.17 (16.81)		52.40 (19.11)		51.00 (17.92)		48.29 (18.97)	
HC Visits	0.85 (1.41)		0.33 (0.52)		1.20 (1.30)		0.88 (1.13)		1.00 (2.24)	

Table 7

Emotional expressivity by writing day (n = 26)

	Total n = 26 M (SD)	Therapist n = 6 M (SD)	LIWC n = 5 M (SD)	Standard n = 8 M (SD)	Control n = 7 M (SD)
Writing Time 1					
Word Count	670.31 (333.30)	746.67 (170.21)	728.60 (436.82)	519.38 (415.88)	735.71 (254.07)
% Total Affect	4.70 (2.63)	4.48 (1.10)	4.32 (1.36)	7.27 (2.87)	2.21 (0.83)
% Negative Affect	2.56 (1.86)	2.56 (1.22)	2.68 (1.10)	4.27 (1.73)	0.53 (0.35)
% Anxiety	0.65 (0.86)	0.71 (0.66)	0.89 (1.26)	0.87 (1.03)	0.18 (0.15)
% Anger	0.90 (0.96)	0.79 (0.68)	0.76 (0.41)	1.67 (1.29)	0.22 (0.24)
% Sadness	0.56 (0.54)	0.57 (0.27)	0.38 (0.34)	1.00 (0.73)	0.18 (0.17)
% Positive Affect	2.09 (1.28)	1.88 (0.72)	1.63 (0.73)	2.92 (1.86)	1.65 (0.81)
% Positive Feeling	0.73 (0.67)	0.71 (0.29)	0.54 (0.44)	1.28 (0.90)	0.26 (0.28)
% Optimism	0.40 (0.38)	0.40 (0.30)	0.34 (0.38)	0.55 (0.44)	0.29 (0.40)
Writing Time 2					
Word Count	582.62 (349.94)	612.00 (284.34)	792.60 (575.99)	427.00 (290.35)	585.29 (231.17)
% Total Affect	4.96 (2.47)	5.40 (1.10)	4.85 (1.10)	6.92 (2.67)	2.42 (1.53)
% Negative Affect	2.71 (2.02)	3.36 (0.96)	2.61 (0.96)	4.23 (2.26)	0.48 (0.52)
% Anxiety	0.76 (0.92)	0.93 (0.48)	0.75 (0.72)	1.20 (1.38)	0.11 (0.12)
% Anger	0.76 (0.71)	0.92 (0.61)	0.75 (0.92)	1.17 (0.64)	0.16 (0.23)
% Sadness	0.66 (0.93)	0.69 (0.56)	0.32 (0.24)	1.37 (1.35)	0.08 (0.14)
% Positive Affect	2.19 (1.23)	1.97 (0.95)	2.11 (0.81)	2.63 (1.73)	1.94 (1.10)
% Positive Feeling	0.58 (0.38)	0.79 (0.61)	0.95 (0.48)	0.80 (0.48)	0.77 (0.49)
% Optimism	0.45 (0.26)	0.65 (0.56)	0.33 (0.25)	0.45 (0.71)	0.49 (0.48)
Writing Time 3					
Word Count	536.88 (277.33)	619.67 (246.18)	618.80 (346.65)	436.25 (314.62)	522.43 (219.51)
% Total Affect	5.25 (2.29)	4.59 (1.41)	5.43 (0.59)	7.15 (2.56)	3.51 (1.87)
% Negative Affect	2.44 (2.06)	2.03 (1.38)	2.73 (1.05)	4.03 (2.68)	0.79 (0.55)
% Anxiety	0.30 (0.45)	0.24 (0.35)	0.22 (0.33)	0.61 (0.62)	0.06 (0.10)
% Anger	0.66 (1.05)	0.41 (0.45)	0.25 (0.34)	1.55 (1.54)	0.15 (0.20)
% Sadness	0.74 (0.67)	0.67 (0.60)	0.85 (0.61)	1.13 (0.79)	0.29 (0.37)
% Positive Affect	2.80 (1.53)	2.54 (0.86)	2.70 (0.77)	3.11 (2.03)	2.72 (1.92)
% Positive Feeling	0.83 (0.77)	0.79 (0.51)	0.72 (0.50)	0.95 (0.69)	0.81 (1.22)
% Optimism	0.56 (0.48)	0.61 (0.54)	0.59 (0.40)	0.51 (0.54)	0.54 (0.49)

Aim 2

The second aim was to determine if feedback changes the amount of emotional language used in writing. This aim was not supported. In examining the word count in participant's writing, no differences were found between the conditions. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 2.74$, $p = 0.25$, therefore sphericity was assumed. The results of the 3 (time) by 4 (group) repeated measures ANOVA showed no differences between the groups, $F(6, 44) = 0.83$, $p = 0.55$, $\eta^2 = 0.10$, small-medium effect, for total word count as measured by LIWC. A graph of this finding can be seen in Figure 10 with the means and standard deviations found in Table 7. It is important to note that the average word count averaged around 600, which is almost twice as much as described in Pennebaker, et al. (2003) but similar level as found in our previous writing study (Owen, et al., 2011).

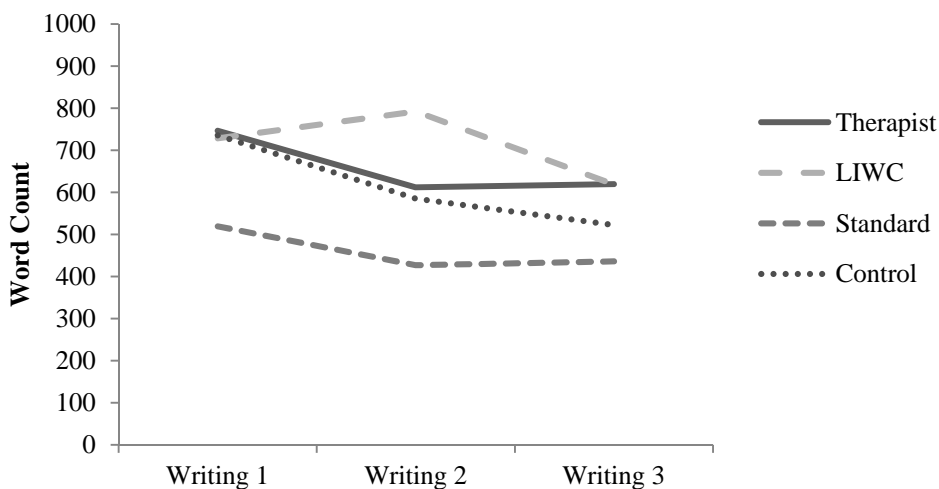


Figure 10: Group Differences between Conditions on Word Count.

Hypothesis 2.1

Hypothesis 2.1 was not supported, suggesting that no difference in total emotional expression between the conditions. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 0.70$, $p = 0.70$, therefore sphericity was assumed. The results of the 3 (time) by 4 (group) repeated measures ANOVA showed no differences between the groups, $F(6, 44) = 0.96$, $p = 0.46$, $\eta^2 = 0.12$, small-medium effect, for total linguistic expressivity. A graph of this finding can be seen in Figure 11 with the means and standard deviations found in Table 7.

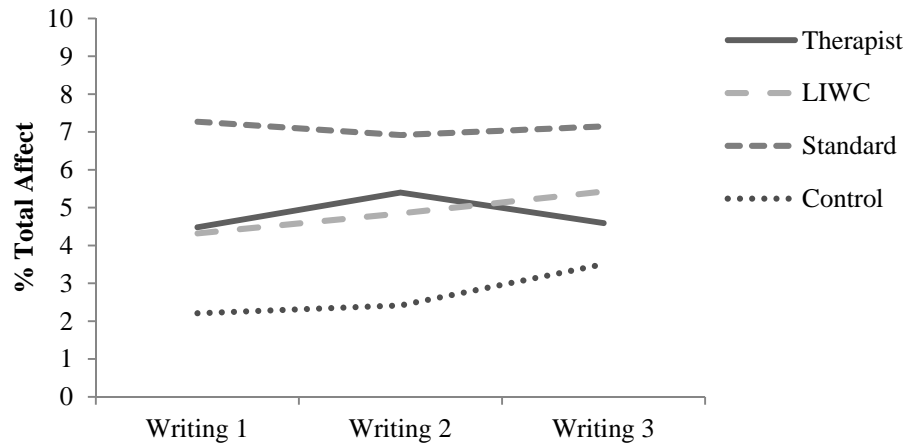


Figure 11: Group Differences between Conditions on Percent Total Affect.

Hypothesis 2.2

Negative Affect

Hypothesis 2.2 was not supported, suggesting that no difference in negative affect linguistic expression between the conditions. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 0.84$, $p = 0.66$, therefore sphericity was assumed. The results of the 3 (time) by 4 (group) repeated measures

ANOVA showed no differences between the groups, $F(6, 44) = 0.82, p = 0.56, \eta^2 = 0.10$, small-medium effect, for negative linguistic expressivity. A graph of this finding can be seen in Figure 12 with the means and standard deviations found in Table 7.

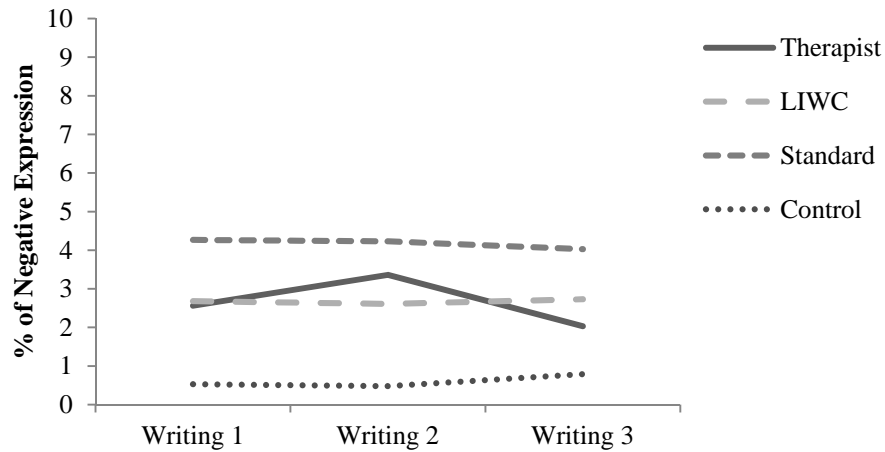


Figure 12: Group Differences between Conditions on Percentage of Negative Emotional Expression.

Anxiety

In examining the percentage of anxiety words used, there was no difference in anxiety linguistic expression between the conditions. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 3.06, p = 0.22$, therefore sphericity was assumed. The results of the 3 (time) by 4 (group) repeated measures ANOVA showed no differences between the groups, $F(6, 44) = 0.38, p = 0.89, \eta^2 = 0.05$, small effect, for anxiety linguistic expressivity. A graph of this finding can be seen in Figure 13 with the means and standard deviations found in Table 7.

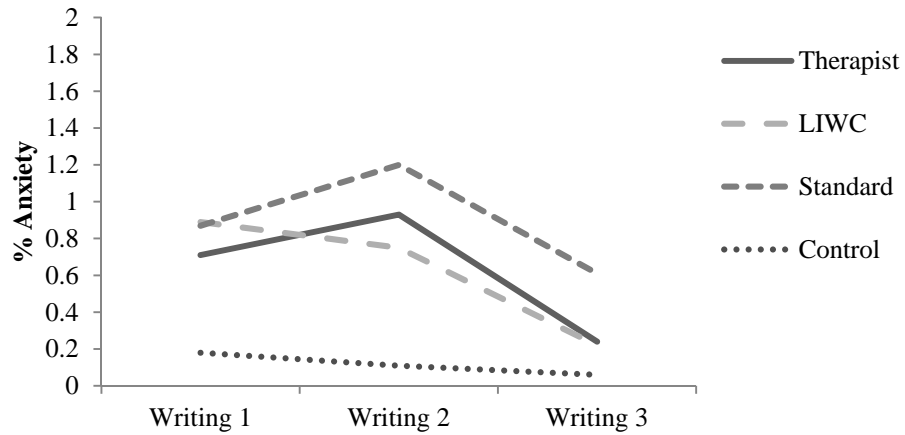


Figure 13: Group Differences between Conditions on Percent of Anxiety Words.

Anger

In examining the percentage of anger words used, there was no difference in anger linguistic expression between the conditions. Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(2) = 12.87$, $p = 0.002$, therefore sphericity was not assumed and degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\epsilon = 0.69$). The results of the 3 (time) by 4 (group) repeated measures ANOVA showed no differences between the groups, $F(4.11, 30.18) = 1.10$, $p = 0.37$, $\eta^2 = 0.131$, medium effect, for anger linguistic expressivity. A graph of this finding can be seen in Figure 14 with the means and standard deviations found in Table 7.

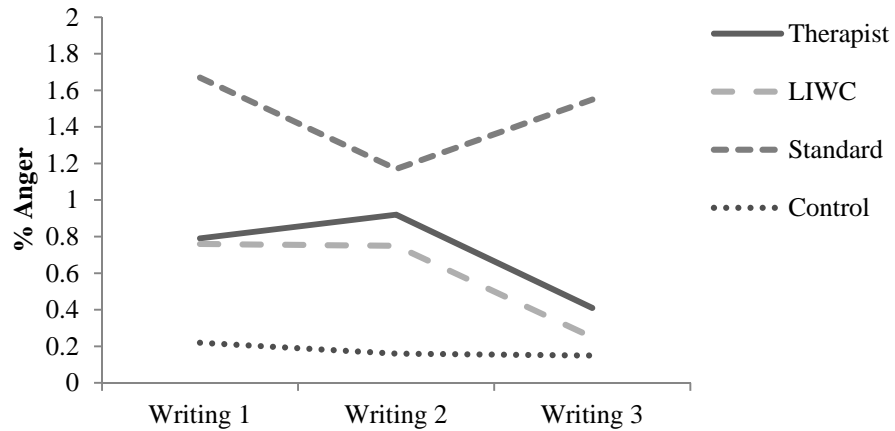


Figure 14: Group Differences between Conditions on Percent of Anger Words.

Sadness

In examining the percentage of sadness words used, there was no difference in sadness linguistic expression between the conditions. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 1.35$, $p = 0.51$, therefore sphericity was assumed. The results of the 3 (time) by 4 (group) repeated measures ANOVA showed no differences between the groups, $F(6, 44) = 1.04$, $p = 0.12$, $\eta^2 = 0.12$, small-medium effect, for sadness linguistic expressivity. A graph of this finding can be seen in Figure 15 with the means and standard deviations found in Table 7.

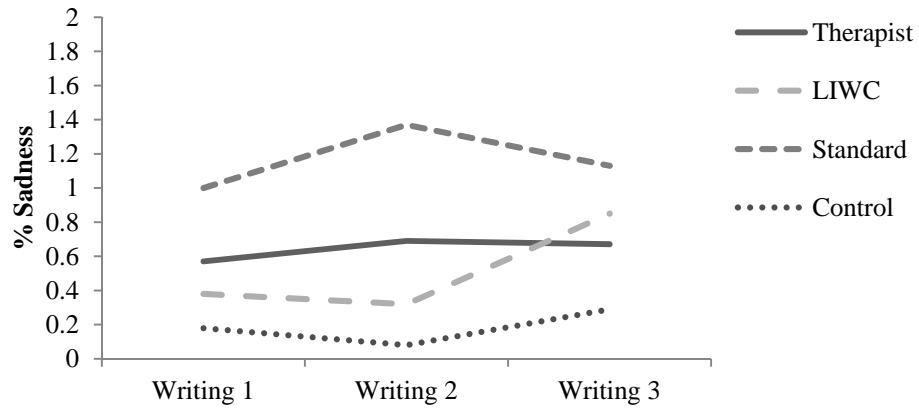


Figure 15: Group Differences between Conditions on Percent of Sadness Words.

Hypothesis 2.3

Positive Affect

Hypothesis 2.3 was not supported, suggesting that no difference in positive affect linguistic expression between the conditions. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 5.52$, $p = 0.06$, therefore sphericity was assumed. The results of the 3 (time) by 4 (group) repeated measures ANOVA showed no differences between the groups, $F(6, 44) = 0.24$, $p = 0.96$, $\eta^2 = 0.03$, small effect, for positive linguistic expressivity. A graph of this finding can be seen in Figure 16 with the means and standard deviations found in Table 7.

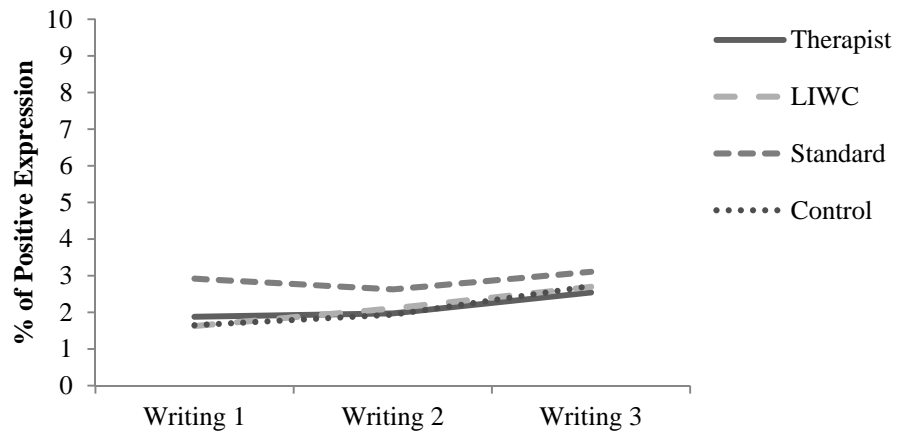


Figure 16: Group Differences between Conditions on Percentage of Positive Expression.

Positive Feelings

In examining the percentage of positive feeling words used, there was no difference in positive feeling linguistic expression between the conditions. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 3.72, p = 0.16$, therefore sphericity was assumed. The results of the 3 (time) by 4 (group) repeated measures ANOVA showed no differences between the groups, $F(6, 44) = 1.45 p = 0.22$, $\eta^2 = 0.17$, medium effect, for positive feeling linguistic expressivity. A graph of this finding can be seen in Figure 17 with the means and standard deviations found in Table 7.

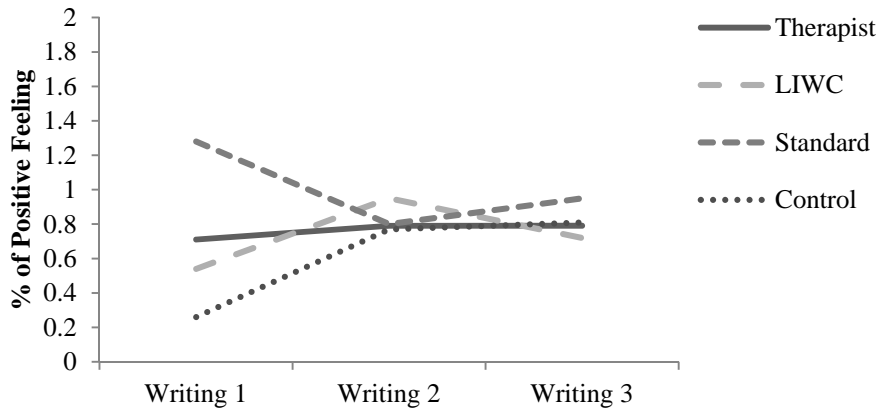


Figure 17: Group Differences between Conditions on Percentage of Positive Feeling Words.

Optimism

In examining the percentage of optimism words used, there was no difference in optimism linguistic expression between the conditions. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 0.39, p = 0.83$, therefore sphericity was assumed. The results of the 3 (time) by 4 (group) repeated measures ANOVA showed no differences between the groups, $F(6, 44) = 0.31, p = 0.93, \eta^2 = 0.04$, small effect, for optimism linguistic expressivity. A graph of this finding can be seen in Figure 18 with the means and standard deviations found in Table 7.

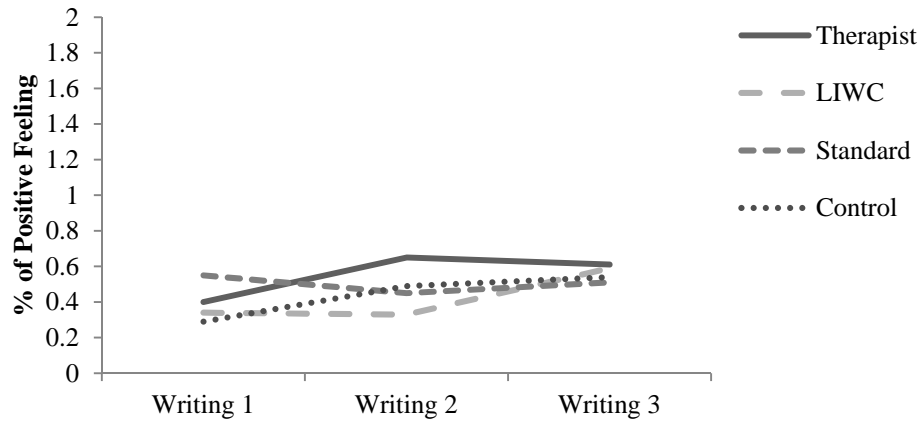


Figure 18: Group Differences between Conditions on Percentage of Optimism Words.

Hypothesis 2.4

Hypothesis 2.4 was supported showing a difference in pleasure expressed during writing between the conditions. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 0.94$, $p = 0.63$, therefore sphericity was assumed. The results of the 3 (time) by 4 (group) repeated measures ANOVA showed differences between the groups, $F(6, 44) = 2.66$, $p = 0.03$, $\eta^2 = 0.27$, large effect, for amount of pleasure experienced during writing. A graph of this finding can be seen in Figure 19 with the means and standard deviations found in Table 6. Specific differences were found between simple control group when compared to standard writing ($p = 0.006$) and LIWC feedback ($p = 0.006$) but not therapist feedback ($p = 0.36$). No other comparisons neared significance.

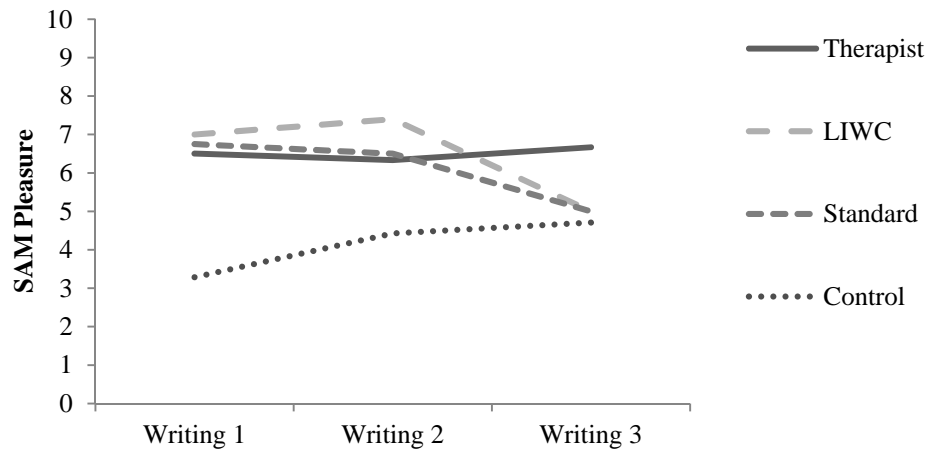


Figure 19: Group Differences between Conditions on SAM measure of Pleasure.

Hypothesis 2.5

Hypothesis 2.5 was not supported showing no difference in arousal expressed during writing between the conditions. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 1.36, p = 0.51$, therefore sphericity was assumed. The results of the 3 (time) by 4 (group) repeated measures ANOVA showed no differences between the groups, $F(6, 44) = 1.80, p = 0.33, \eta^2 = 0.14$, medium effect, for amount of arousal experienced during writing. A graph of this finding can be seen in Figure 20 with the means and standard deviations found in Table 6.

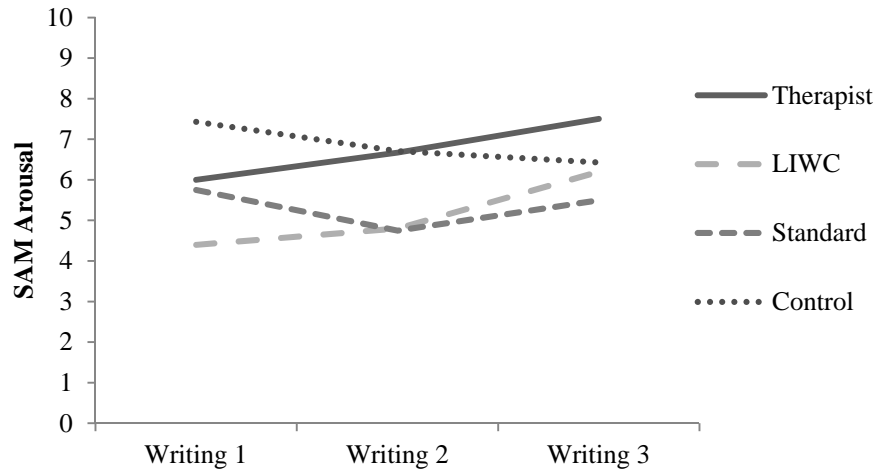


Figure 20: Group Differences between Conditions on SAM measure of Arousal.

Hypothesis 2.6

Hypothesis 2.6 was not supported showing no difference in dominance expressed during writing between the conditions. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 0.24$, $p = 0.88$, therefore sphericity was assumed. The results of the 3 (time) by 4 (group) repeated measures ANOVA showed no differences between the groups, $F(6, 44) = 0.94$, $p = 0.48$, $\eta^2 = 0.11$, small-medium effect, for amount of dominance experienced during writing. A graph of this finding can be seen in Figure 21 with the means and standard deviations found in Table 6.

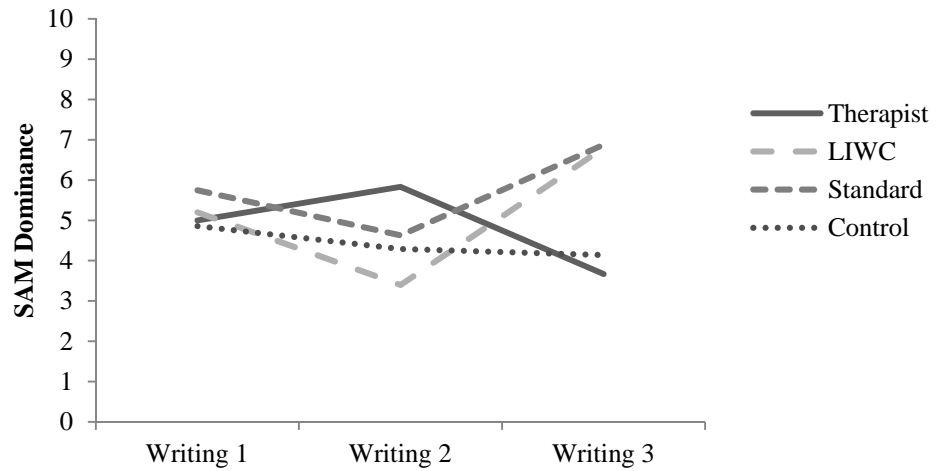


Figure 21: Group Differences between Conditions on SAM measure of Dominance.

Aim 3

The third aim was to determine if feedback on emotional expression enhances mental and physical health over previous emotional expression writing paradigms. This aim was not supported.

Hypothesis 3.1

Hypothesis 3.1 was not supported suggesting that tailoring results in no changes in physical health symptoms upon follow-up. The results of the 2 (time) x 4 (group) repeated measures ANOVA showed no group differences in physical health, $F(3, 22) = 0.64, p = 0.60, \eta^2 = 0.08$, small-medium effect. A graph of this finding can be seen in Figure 22 with the means and standard deviations found in Table 6.

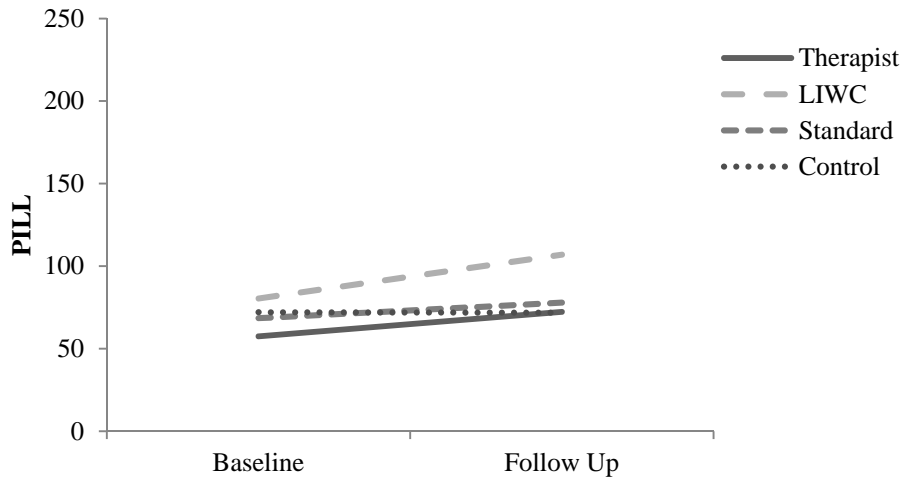


Figure 22: Group Differences between Conditions on Physical Health as Measured by the PILL.

In examining the total number of physical symptoms endorsed by the participants, the results of the 2 (time) x 4 (group) repeated measures ANOVA showed nonsignificant group differences, $F(1, 22) = 0.774, p = 0.51, \eta^2 = 0.095$, small-medium effect. A graph of this finding can be seen in Figure 23 with the means and standard deviations found in Table 6.

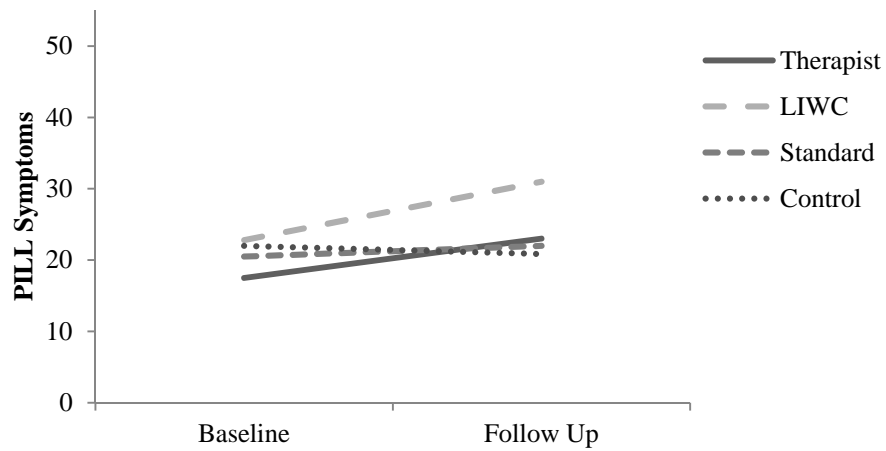


Figure 23: Group Differences between Conditions on Physical Health as Measured by PILL Symptom Total.

The results of the 2 (time) x 4 (group) repeated measures ANOVA showed significant group differences, $F(3, 22) = 3.26, p = 0.04, \eta^2 = 0.307$, large effect, between groups on the total number of sick days taken in the last 30 days. However, no significant differences were found within the bonferroni post hoc comparisons ($ps = n.s.$). A graph of this finding can be seen in Figure 24 with the means and standard deviations found in Table 6. As seen in the graph, these differences were most likely due to increase in symptoms related to the LIWC group.

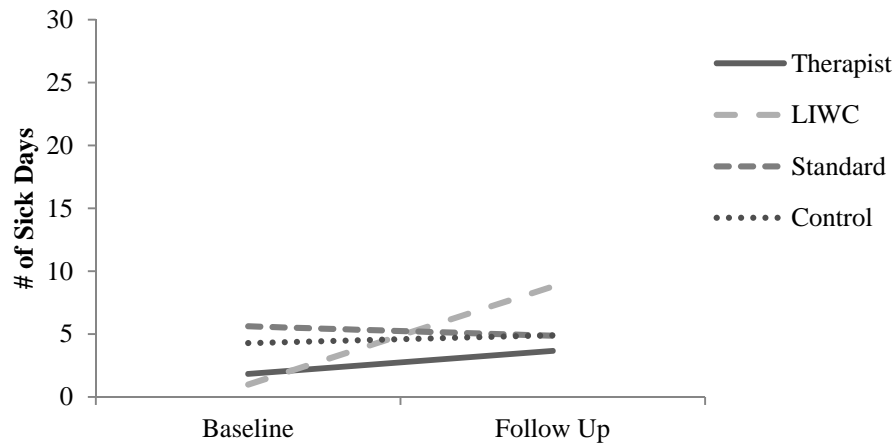


Figure 24: Group Differences between Conditions on Physical Health as Measured by # of Sick Days.

Finally, the results of the 2 (time) x 4 (group) repeated measures ANOVA showed nonsignificant group differences, $F(3, 22) = 1.99, p = 0.145, \eta^2 = 0.21$, medium-large effect, between the group on the total number of days restricted in the last 30 days. A graph of this finding can be seen in Figure 25 with the means and standard deviations found in Table 6.

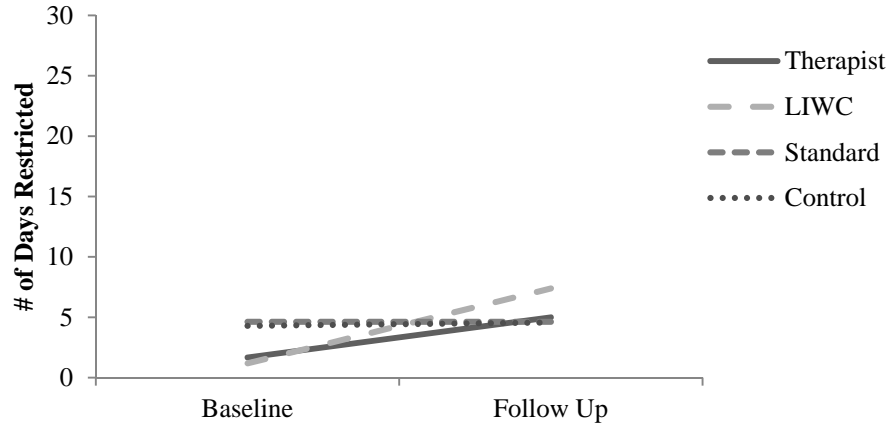


Figure 25: Group Differences between Conditions on Physical Health as Measured by # of Days Restricted.

Hypothesis 3.2

Hypothesis 3.2 was not supported suggesting that tailoring results in similar levels of distress upon follow-up. The results of the 2 (time) x 4 (group) repeated measures ANOVA showed no group differences in the psychological distress, $F(3, 22) = 1.30, p = 0.298, \eta^2 = 0.15$, medium effect. A graph of this finding can be seen in Figure 26 with the means and standard deviations found in Table 6.

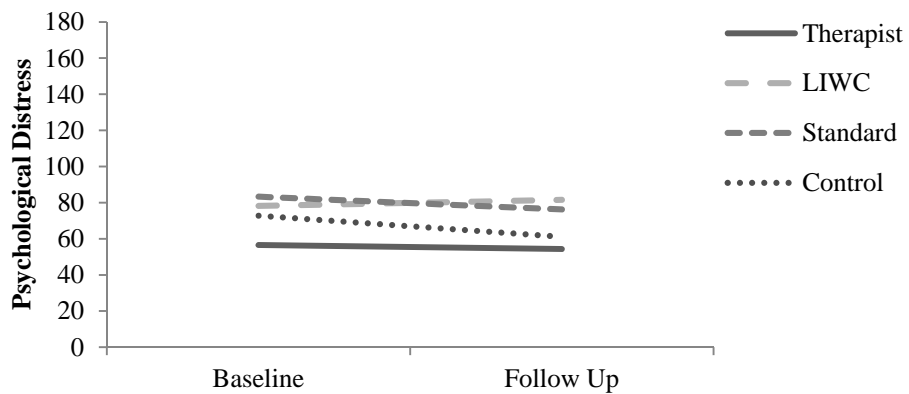


Figure 26: Group Differences between Conditions on Psychological Distress as measured by the OQ-45.

Hypothesis 3.3

Hypothesis 3.3 was not supported suggesting that tailoring results in similar levels of symptoms of PTSD upon follow-up. The results of the 2 (time) x 4 (group) repeated measures ANOVA showed no group differences in the PTSD symptoms, $F(3, 22) = 0.88$, $p = 0.47$, $\eta^2 = 0.11$, small-medium effect. A graph of this finding can be seen in Figure 27 with the means and standard deviations found in Table 6.

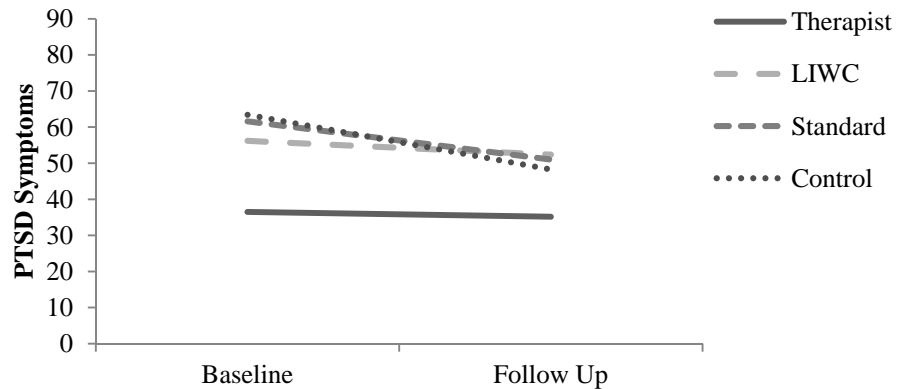


Figure 27: Group Differences between Conditions on Symptoms of PTSD as measured by the PCL-S.

Hypothesis 3.4

Hypothesis 3.4 was not supported suggesting that tailoring results in similar use of healthcare services upon follow-up. The results of the 2 (time) x 4 (group) repeated measures ANOVA showed no group differences in the amount of health care participants self reported using in the last 30 days, $F(3, 22) = 1.23$, $p = 0.36$, $\eta^2 = 0.13$, medium effect. A graph of this finding can be seen in Figure 28 with the means and standard deviations found in Table 6.

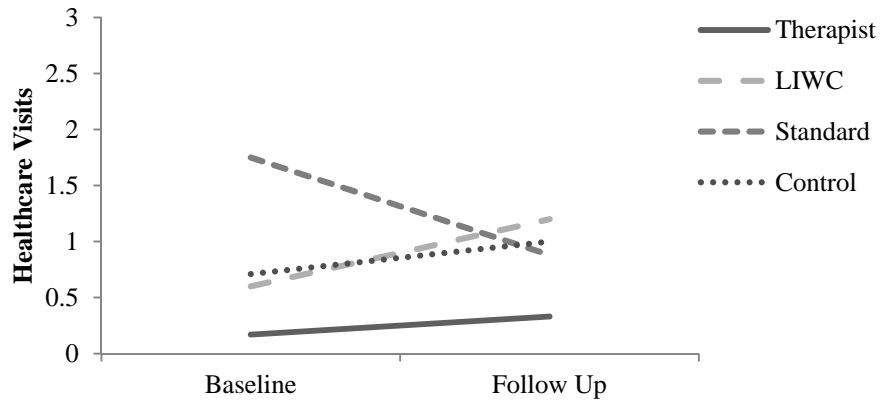


Figure 28: Group Differences between Conditions Health Care Utilization.

CHAPTER FOUR

DISCUSSION

Summary of Findings

Aim 1

The first aim was to replicate previous research findings that emotional expression positively affects mental and physical health. The findings from this study suggest that expressive writing had no influence on either the participants' physical health or their mental health upon follow-up. This finding is in contrast to other studies that have found reductions in the number of health center visits (e.g., M. A. Greenberg & Stone, 1992; Pennebaker & Beall, 1986; Pennebaker, et al., 1990; Pennebaker & Francis, 1996; Pennebaker, et al., 1997), self-reported physical symptoms (e.g., M. A. Greenberg & Stone, 1992; Pennebaker, et al., 1997; Richards, et al., 2000; Sloan, et al., 2007), or negative emotions (e.g., Gortner, et al., 2006; Lepore, 1997; Sloan, et al., 2007). The results are also similar to other studies that failed to find reduction in PTSD symptomology (Sloan, et al., 2011; Smyth, et al., 2008). It is important to note that a few studies did demonstrate expressive writing to be helpful in reducing on PTSD symptoms (Sloan & Marx, 2004a; Sloan, et al., 2005, 2007). Additionally, one study found a negative effect where PTSD symptoms increased (Gidron, et al., 1996). Finally, the number of studies that have not found an effect is not known; only a few studies have been published that do not show physical and mental health benefits (e.g., Kloss & Lisman, 2002). A "file drawer" effect could be occurring.

Aim 2

The second aim was to determine if feedback changes the amount of emotional language used in writing. The findings from this study showed no significant differences between conditions. It is important to note that non-significant differences were observed when the experimental conditions showed a greater increase in total and negative emotion. However, the findings failed to demonstrate that linguistic tailoring actually produced a significant or even non-significant correspondence between Pennebaker's Standard writing instructions and our two feedback groups. Previously, it was documented that linguistic emotional expression could be increased through feedback, even the relatively simple feedback of self-reporting one's own emotionality as high, average, or low (Owen, et al., 2011). A major difference between Owen, et al. (2011) and the present study is that in the former study, the feedback messages were delivered via video and audio messages and in the latter, messages were delivered in writing. However, other studies comparing information delivered via text or video found no difference for lifestyle change; specifically, smoking cessation (Stanczyk, Crutzen, Catherine, Muris, & De Vries, 2013) and physical activity (Vandelanotte, Duncan, Plotnikoff, & Mummery, 2012).

Regarding the SAM findings, it does not come as a surprise that individuals writing about their traumatic experiences would report more displeasure than the control groups. Writing about a traumatic or stressful experience is not something that most people are likely to enjoy. Furthermore, avoidance of displeasure associated with certain memories is a symptom of PTSD (APA, 2000) and trauma treatment focuses upon overcoming this avoidance (Foa & Rothbaum, 1998).

Aim 3

The third aim was to determine if feedback on emotional expression enhances mental and physical health over previous emotional expression writing paradigms. This aim was not supported by the present data. Given that Aim 1 and Aim 2 were not supported, it is not surprising that significance was not achieved for Aim 3. There are a number of factors that might have influenced the lack of a significant finding. In Franttaroli's (2006) meta-analysis, the studies reviewed had sample sizes ranging from 14 to 535; this places the present study's sample size on the lower end of the spectrum. Estimates from G*Power suggest that a minimal sample size of at least 50 would be necessary for significance to be achieved (to show an effect for all five conditions). Finally, it is also possible that increased emotional expression through feedback might not actually influence changes in mental and physical health. Until a sufficient sample size and replication of any significant findings are pursued, this question will remain insufficiently answered.

Limitations

Sample

Although addressed previously, it is important to highlight that the small sample size contributed to the limited significance of the results. While some general themes have been highlighted previously, the continuation of the study to reach an acceptable sample size would also allow further evaluation of the effect of tailored feedback on emotional expression and the physical and psychological benefits associated with this emotional expression. As of this dissertation document being sent to committee, the

sample size has increased significantly. Specifically, 247 individuals have signed up with 244 being eligible for the study and 199 consenting. Furthermore, 104 have completed the three writing sessions and 53 have completed the follow up measures.

The sample was comprised of mostly Caucasian individuals with either some college or a college degree, the demographic characteristics most highly associated with access to the Internet (U.S. Census Bureau, 2010). The convenience sample achieved might not be representative of the population of Internet users; specifically, the majority of users ranged in age from their late twenties to middle thirties. This sample is different from some of the studies that found differences with regard to PTSD symptomology (Sloan & Marx, 2004a; Sloan, et al., 2005, 2007); in the Sloan studies the population examined was undergraduate college students attending a university. Furthermore, the initial sample that signed up for the study might have been comprised of individuals with a vested interest in helping the author finish his degree. However, due to the anonymity of the data, it is uncertain exactly who constituted this sample.

Additionally, not all participants who started the study completed the three days of writing. It appears that a number of participants either failed to consent (4%), did not complete the baseline survey (5%), or failed to start the writing portion of the experiment (20.9%). At the initial two junctures, feedback was given, at the request of the Internal Review Board (IRB), suggesting that we warn participants that they have either a significant level of PTSD symptoms (PCL), distress (OQ-45.2), or potential suicidal ideation (Item 8 on OQ-45.2). They were then given web links to assist in finding therapy in their area. While from a therapeutic and legal standpoint, this was the appropriate and ethical action, this might have been off-putting to individuals who until this point might

not have believed that they qualified as having a “mental disorder.” This might have resulted in some more distressed individuals opting to quit the study due to this feedback.

Lastly, in the final analysis, one of the five groups (i.e., Self-Report Feedback) had to be excluded due to limited sample size ($n = 1$). It appears that this low sample size was not due to problematic attrition (see flow sheet), but rather, those assigned to this condition did not adequately complete the baseline measures or failed to start the initial writing. Furthermore, a number of those in this condition had also not completed the baseline measures before the data was removed for analysis. Therefore, it is uncertain what effect receiving feedback based on the self-report measures would have had on participants.

Feedback

Receiving Feedback

A clear issue became apparent quickly after the study went live: the fact that the feedback was given by the therapist. While this feedback was similar in length (as determined by word count), it might have been easily distinguished from feedback given by a computer. However, upon follow up, those in the LIWC Feedback Condition ($M = 3.50$, $SD = 3.00$) showed no difference when compared to the Therapist Condition ($M = 2.14$, $SD = 1.35$) in classifying on a scale of 1 (human) to 7 (computer) the author of the feedback, $t(9) = 1.06$, $p = 0.32$. It also might be speculated that since 33.1% ($n = 5$) of the therapist group dropped out of the study after receiving the initial feedback, as compared to 0% (control, standard, self-report) to 16.7% ($n = 1$; LIWC) of the other groups, participants might not have liked having their writing read by a human and then receiving

feedback. However, since those individuals opted out of the experiment, it is impossible to say why they did so. Future studies might consider asking participants how meaningful this experience of writing was for them, if they got feedback from a computer or human (dichotomous variable), and the SAM questions to better determine why they might be dropping out. Finally, it is important to point out that in the original Linguistic Writing Paradigm, participants initially would turn their essays in to a box, ensuring their anonymity (Kacewicz, et al., 2007; Pennebaker, 1997).

Giving Feedback

In giving feedback as a therapist, some interesting ethical dilemmas were raised. Specifically, the therapists regularly consulted each other regarding feedback. Originally, this consultation was designed to keep the feedback consistent; however, ethical issues surrounding potential suicidal ideation and stories of histories of child abuse were typically discussed. A determination that the therapists should review these cases was instituted and consultation was utilized. However, in the original writing studies, these issues might have seemed depersonalized and historic when the stories are scanned by a computer and may be read for the purposes of spell checking, as in the original writing paradigm. However, the personalization and ethical issue surrounding having a therapist read these writings created a completely different situation. After consultation, when these issues came up, we would give the National Suicide LifeLine [1-800-273-TALK (8255)] and National Child Abuse Hotline [1-800-4-A-CHILD (1-800-422-4453)] respectfully when someone indicated historic (or potentially present) child abuse or when self-harm was discussed.

Additionally, acting as a therapist was also time intensive. On average, it took around 20 minutes to give someone feedback on writing. This, coupled with a 16 hour turn-around, made it very stressful to return feedback in a timely and efficient manner. This highlighted the need for effective computerized tailored interventions that can meet the time demands and also achieve similar effectiveness as a human.

Depth of Processing

One of the limitations of the LIWC program is how it classifies emotional experience; it does so primarily on word count. While the LIWC has been shown to be a valid instrument for identifying emotional expression in linguistic data, it does seem to over-identify emotional expression (Bantum & Owen, 2009). Furthermore, it is true that emotional expression as measured by LIWC has been linked to both mental and physical health benefits (Frattaroli, 2006; Frisina, et al., 2004; Pennebaker, 1997; Smyth, 1998); however, understanding the true mechanism behind the writing paradigm is also important. It would be important to understand the depth of processing within subjects' writing and how this changes and improves between groups, through feedback, and as simply as the participant writes. Specifically, if there is an aspect of exposure within the expressive writing that influences the symptoms of distress, then the depth to which individuals process the exposure (Foa & Rothbaum, 1998) and the beliefs that influence the meaning that the event carries for that individual (Resick & Schnicke, 1992; Resick & Schnicke, 1993) are important aspects to quantify for future analysis.

Fraudulent Users

During the data collection phase of this study, seven fraudulent accounts were identified originating from the same user. This individual was using different Internet Protocol (IP) addresses, giving different home addresses, and using different email accounts. It only came to the attention of the researcher through routine feedback consultation meetings between therapists, when two of the therapists had found unreadable writing samples. When the data logs were checked, this individual was identified because he or she used the same security question and answer that can be accessed by the experimenters to reset passwords. Identifying fraudulent users within Internet studies has become an additional project based on this dissertation (see Owen, Hanson, Bantum, Yamato, Criswell, Lima, & Elhadad, unpublished manuscript).

Implications

Further Research

Future Analyses

Given the limited timeframe of the data collection and the length of follow-up, the data collected for this dissertation was only an initial snapshot of the findings. Therefore, data collection will resume until around 150 participants complete the study and adequate power can be achieved for the statistical analyses. With an adequate sample size and sufficient power, it will be possible to determine if linguistic tailoring has an influence on physical and mental health changes within an expressive writing paradigm.

Analysis of Depth of Processing

The present study is the first part of a two-part study focusing on the examination of emotional expression within a given context. Therapeutic expressive writing must not only express emotion, but it must tell a story in a narrative format; without a narrative, emotional expression is not beneficial (Kaufman & Sexton, 2006; Pennebaker & Seagal, 1999). To help identify how participants construct meaning, a depth of processing measure will be utilized. The Client Experiencing Scale (EXP) was derived from experiential and client-centered psychotherapy theories to measure an individual's participation within therapy (M. H. Klein, Mathieu, Gendlin, & Kiesler, 1969; M. H. Klein, Mathieu-Coughlan, & Kiesler, 1986). The scale was originally designed to be utilized with recordings or transcripts of therapy sessions, but has been applied to other formats such as monologues, group therapy, and written materials (M. H. Klein, et al., 1986). This scale will allow the researchers to gain insight into the individual's ability to engage, process, and create meaning during the writing sessions.

A few other studies (e.g., O' Cleirigh, et al., 2003) have examined depth of processing using seven-point Likert scales with dimensions such as "positive cognitive appraisal change," "self-esteem improvements," etc. Emotional expression, as defined by the LIWC program, has been shown to be highly correlated with depth of processing.

Client Experiencing Scale

The EXP will be utilized in the second part of the present study, which is not included as part of this dissertation. This measure is coded by two trained raters who read the participants' essays and score them on a 7-point scale to measure the depth of

processing (see Table 8). This measure ranges from 1 (impersonal or superficial) to 7 (feeling exploration and/or self awareness). The EXP depth of processing levels can be found below in the therapist feedback instructions. With regard to validity, the EXP has been associated with a therapeutic outcome, as well as motivation and openness to therapy (M. H. Klein, et al., 1986).

Table 8

Depth of Processing as defined by (M. H. Klein, et al., 1969).

Level	Depth of Processing
One	The client's content or manner of expression is impersonal, abstract, and general. Feelings are avoided, and personal involvement is absent from communication.
Two	The association between the client and the content is clear. The client's involvement, however, does not go beyond the specific situation or content.
Three	The content is narrative or description of the client in external or behavioral terms, with added comments on feelings or personal reactions.
Four	The quality of involvement clearly shifts the client's attention to the subjective felt flow of experience, rather than to events or abstractions.
Five	The client defines and internally elaborates a problem or question about the self.
Six	The client synthesizes new feelings and meanings discovered in ongoing explorations to resolve current problems.
Seven	At this rarely attained level, the client achieves steady and expanding awareness of immediately present feelings and internal processes, linking and integrating felt nuances of experience as they occur in the present moment.

Formal training in using the EXP consists of eight 2-hour sessions with a total of 80 practice segments in addition to 20 final assessments of the raters' skills. The training procedures can be found in Klein et al.'s (1969) manual. No difference has been noted

between professional and nonprofessional (e.g., undergraduate) raters after finishing the training program. No apparent difference has been noted between raters viewing a tape vs. transcript, but lower coefficients are noted if data types are mixed. However, lower ratings have been found in other types of assessments (M. H. Klein, et al., 1986).

Within the EXP scale, the initial three levels (1-3) demonstrate progressive ownership of affective reactions. The fourth stage is the transition from an external environmental process to an internal process in which the individual describes his or her emotional phenomenology, a critical stage for psychotherapy. Finally, the latter three stages (5-7) focus on the progression of the integration of this perspective (M. H. Klein, et al., 1986).

As a part of the larger research project, two trained raters are needed to determine the peak and mode depth of processing for all of the texts. The peak is the highest depth of processing within the writing segment, whereas the mode is the most frequent level of processing (M. H. Klein, et al., 1969). These scores can then be analyzed to identify the influence of depth of processing on emotional expression as measured by LIWC as well as physical and mental health changes. Additionally, variations in depth of processing between feedback conditions will also be examined.

Future Directions

A message that is tailored to the individual has been found in other research to be superior to standard instructions (Keller & Lehmann, 2008). While this finding was not upheld in the present data, further examination of the mechanisms of tailoring will be

important for future studies of linguistic analysis. The influence of a few important factors on tailoring within expressive writing are still unknown.

Video and Text Based Feedback

Studies examining tailored messages given via written text or video have found no differences between groups in terms of effectiveness (Stanczyk, et al., 2013; Vandelanotte, et al., 2012). It is still unknown if this remains true for linguistic tailoring within an expressive writing paradigm. In Owen et al., (2011) significant differences were observed by giving very basic feedback via video telling participants that their emotional expression was high, average, or low. Thus, it will be important to understand if the mode of feedback (e.g., video, text, or avatar) has any bearing on changes in emotional expression or physical/mental health.

Type of Feedback

The present study attempted to understand if the type of feedback (e.g., LIWC, self-report, or therapist) had any bearing on the participants' emotional expression. While this question could not be adequately answered given the limited power and sample size, it is one that is important for future research to continue to examine. Furthermore, the depth of the algorithms in pulling, categorizing, and delivering feedback is a critical aspect that requires continued examination. Just as some psychotherapeutic interventions are more likely to effect change (Parry, 2000), more effective tailoring of messages for linguistic feedback will likely elicit greater emotional expression and symptom reduction.

Timing of Feedback

The timing of the experimental writing (daily vs. weekly) does not seem to influence the outcome (Frattaroli, 2006). However, it is unknown if the timing of feedback might influence emotional expression. In Owen et al. (2011), participants were given feedback right after completing their writing. In the present study, participants were given their feedback with their instructions for the next day. It is not known if timing in these studies might have influenced participants' writing, either by offering additional time to process the information or prompting participants with feedback so it is fresh in their minds. Furthermore, with more advanced algorithms, it might be possible to actually give feedback in real time so that participants can modify their writing behavior on the spot to get the maximum benefit from the experimental writing.

Summary

The present study aimed to replication previous research with regard to mental and physical health benefits and increasing emotional expression. Furthermore, this study attempted to build upon this previous research and utilize theory driven feedback interventions for the purposes of increasing emotional expression and influencing mental and physical health benefits. However, given the small sample size and insufficient power, these findings were not supported. Having an increased sample size and sufficient power should help uncover if writing study interventions can be enhanced through feedback messages.

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APPENDIX A

DEMOGRAPHIC QUESTIONNAIRE

To get started, please tell us a little bit about your current living situation.

What is your gender?

What is your current age, in years?

How would you describe your ethnicity?

- American Indian or Alaskan Native
- Asian (Chinese, Japanese, Korean, Filipino, or of Far East, Southeast Asia, or Indian subcontinent)
- Black or African American
- Native Hawaiian or other Pacific Islander (Guam, Samoa or other Pacific Islands)
- White
- Other (please specify):

Do you consider yourself Hispanic or Latino?

How many years of formal education have you completed (e.g., high school = 12)?

Have you ever been told by a doctor or other health professional that you have a chronic medical condition, such as high blood pressure, heart disease, cancer, diabetes, asthma, etc.?

Have you ever been told by a doctor, psychiatrist, psychologist, counselor or other health professional that you have depression, anxiety, post-traumatic stress, or any other mental health disorder?

Are you a student at the University of Hawai'i?

- No
- Yes

APPENDIX B

BERKELEY EXPRESSIVITY QUESTIONNAIRE

For each statement below, please indicate your agreement or disagreement. Do so by filling in the blank in front of each item with the appropriate number from the following rating scale:

1	2	3	4	5	6	7
<u>strongly disagree</u>			neutral			<u>strongly agree</u>

- ___ 1. Whenever I feel positive emotions, people can easily see exactly what I am feeling.
- ___ 2. I sometimes cry during sad movies.
- ___ 3. People often do not know what I am feeling.
- ___ 4. I laugh out loud when someone tells me a joke that I think is funny.
- ___ 5. It is difficult for me to hide my fear.
- ___ 6. When I'm happy, my feelings show.
- ___ 7. My body reacts very strongly to emotional situations.
- ___ 8. I've learned it is better to suppress my anger than to show it.
- ___ 9. No matter how nervous or upset I am, I tend to keep a calm exterior.
- ___ 10. I am an emotionally expressive person.
- ___ 11. I have strong emotions.
- ___ 12. I am sometimes unable to hide my feelings, even though I would like to.
- ___ 13. Whenever I feel negative emotions, people can easily see exactly what I am feeling.
- ___ 14. There have been times when I have not been able to stop crying even though I tried to stop.
- ___ 15. I experience my emotions very strongly.
- ___ 16. What I'm feeling is written all over my face.

APPENDIX C

COURTAULD EMOTIONAL CONTROL SCALE

Below are listed some of the reactions people have to certain feelings or emotions. Reach each one and indicate how it describes the way you generally react by circling a number from “1” (almost never), to “4” (almost always). Please work quickly.

	Almost Never			Almost Always
When I feel anger (very annoyed).....				
1. I keep quiet	1	2	3	4
2. I refuse to argue or say anything	1	2	3	4
3. I bottle it up	1	2	3	4
4. I say what I feel	1	2	3	4
5. I avoid making a scene	1	2	3	4
6. I smother my feelings	1	2	3	4
7. I had my annoyance	1	2	3	4
When I feel unhappy (sad/depressed).....				
8. I refuse to say anything about it	1	2	3	4
9. I had my unhappiness	1	2	3	4
10. I put on a bold face	1	2	3	4
11. I keep quiet	1	2	3	4
12. I let others see how I feel	1	2	3	4
13. I smother my feelings	1	2	3	4
14. I bottle it up	1	2	3	4
When I feel afraid (worried/anxious).....				
15. I let others see how I feel	1	2	3	4
16. I keep quiet	1	2	3	4
17. I refuse to say anything about it	1	2	3	4
18. I tell others all about it	1	2	3	4
19. I say what I feel	1	2	3	4
20. I bottle it up	1	2	3	4
21. I smother my feelings	1	2	3	4

APPENDIX D

SELF-ASSESSMENT MANIKIN

Pleasure

Happy vs Unhappy

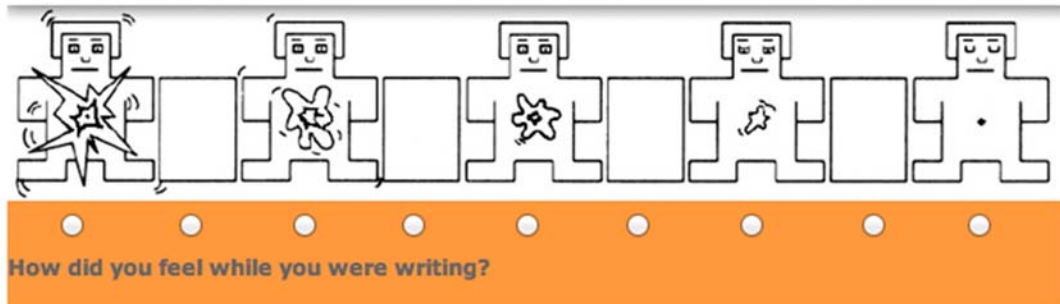
This first scale is the Happy-Unhappy scale, which ranges from a smile to a frown. At one extreme of the happy vs unhappy scale, you felt happy, pleased, satisfied, contented, hopeful while writing. If you felt completely *happy* while writing, you can indicate this by checking the button at the left. The other end of the scale is if you felt completely unhappy, annoyed, unsatisfied, melancholic, despaired, or bored while writing. You can indicate feeling completely *unhappy* by checking the button at the right. The figures also allow you to describe intermediate feelings of pleasure by checking a button anywhere between the two extremes of the happy vs unhappy scale. If you felt completely neutral, neither happy or unhappy, check the button in the middle.

How did you feel while you were writing?

Arousal

Excited vs Calm

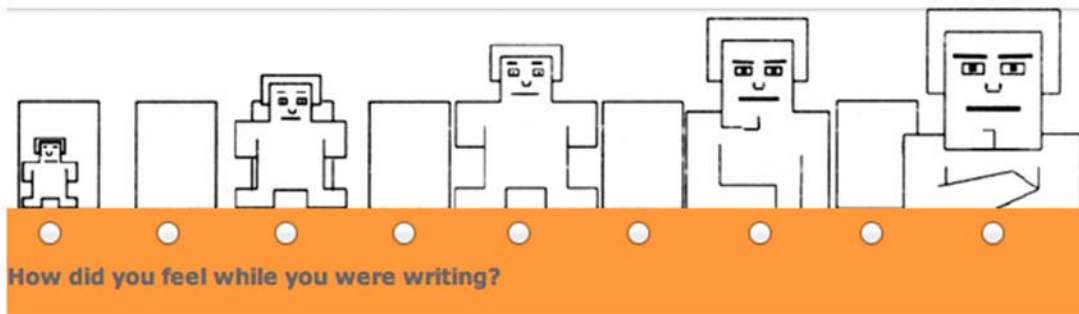
The excited vs. calm dimension is the second type of feeling displayed here. At one extreme of the scale you felt stimulated, excited, frenzied, jittery, wide-awake, or aroused. If you felt completely aroused while writing, check the button at the left of the row. On the other hand, at the other end of the scale, you felt completely relaxed, calm, sluggish, dull, sleepy, unaroused while writing. You can indicate you felt completely calm by checking the button at the right of the row. As with the happy vs unhappy scale, you can represent intermediate levels by checking any of the other buttons. If you were not at all excited nor at all calm while writing, check the button in the middle of the row.



Dominance

Controlled vs In-Control

The last scale of feeling that you will rate is the dimension of controlled vs. in-control. At one end of the scale you have feelings characterized as completely controlled, influenced, cared-for, awed, submissive, guided. Please indicate feeling controlled by checking the button at the left. At the other extreme of this scale, you felt completely controlling, influential, in control, important, dominant, autonomous. You can indicate that you felt dominant by checking the button at the right of the row. Note that when the figure is large, you feel important and influential, and that it will be very small when you feel controlled and guided. If you feel neither in control nor controlled check the button in the middle picture. Remember you can also represent your feelings by checking any button between the extremes of this scale.



APPENDIX E

ESSAY EVALUATION QUESTIONNAIRE

In answering the following questions, consider all three days of your writing. Answer the following questions on a scale from 1 to 7:

- 1. Overall, how personal were the essays that you wrote:
Not at all | -----+-----+-----+-----+-----+----- | Personal
- 2. Prior to the experiment, how much had you told other people about what you wrote:
Not at all | -----+-----+-----+-----+-----+----- | A great deal
- 3. Overall, how much did you reveal your emotions in what you wrote:
Not at all | -----+-----+-----+-----+-----+----- | A great deal
- 4. How much have you actively held back from telling others about what you wrote:
Not at all | -----+-----+-----+-----+-----+----- | A great deal
- 5. Prior to the experiment, how much had you wanted to talk with someone about what you wrote:
Not at all | -----+-----+-----+-----+-----+----- | A great deal
- 6. Over the last 3 days, how difficult has it been for you to write during the experiment:
Not at all | -----+-----+-----+-----+-----+----- | Extremely
- 7. In general, how sad or depressed have you felt over the last 3 days:
Not at all | -----+-----+-----+-----+-----+----- | Extremely
- 8. In general, how happy have you felt over the last 3 days:
Not at all | -----+-----+-----+-----+-----+----- | Extremely
- 9. During your normal day, to what degree have you thought about this experiment since it began:
Not at all | -----+-----+-----+-----+-----+----- | A great deal
- 10. Since the beginning of the study, during the hours that you were not involved in the experiment, to what degree have you thought about the topics that you wrote about:
Not at all | -----+-----+-----+-----+-----+----- | A great deal
- 11. Before the experiment ever began, to what degree did you think about the topics you wrote about:
Not at all | -----+-----+-----+-----+-----+----- | A great deal

12. How important has it been to you that your essays were anonymous:

Not at all | -----+-----+-----+-----+-----+----- | Extremely

13. To what degree would you like other people (who you don't know) to read your anonymous essays:

Would not like it at all | -----+-----+-----+-----+-----+----- | Would like it a great deal

14. To what degree would you like to have your essays thrown away without anyone ever reading them:

Would not like it at all | -----+-----+-----+-----+-----+----- | Would like it a great deal

15. Other than receiving extra credit, to what degree has this experiment been valuable or meaningful for you:

Not at all | -----+-----+-----+-----+-----+----- | Extremely Valuable/meaningful

16. If you received advice on your writing, how much do you feel this advice was helpful or useful?

Not at all | -----+-----+-----+-----+-----+----- | Extremely

17. How accurate do you feel this advice or feedback was to you?

Not at all | -----+-----+-----+-----+-----+----- | Extremely

18. To what extent do you feel this advice was generated from a computer or a human?

Human | -----+-----+-----+-----+-----+----- | Computer

Answer the following questions on a scale from 1 to 7 with 1 being "not at all" and 7 being "a great deal":

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

Not at all | -----+-----+-----+-----+-----+----- | A great deal

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

Not at all | -----+-----+-----+-----+-----+----- | A great deal

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

Not at all | -----+-----+-----+-----+-----+----- | A great deal

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

Not at all | -----+-----+-----+-----+-----+----- | A great deal

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

Not at all | -----+-----+-----+-----+-----+----- | A great deal

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

Not at all | -----+-----+-----+-----+-----+----- | A great deal

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

Not at all | -----+-----+-----+-----+-----+----- | A great deal

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

9. If you had the chance to do it over again, would you participate in this study:

definitely yes _____

probably yes _____

don't know _____

probably no _____

definitely no _____

APPENDIX F

PENNEBAKER INVENTORY OF LIMBIC LANGUIDNESS

The PILL

Several common symptoms or bodily sensations are listed below. Most people have experienced most of them at one time or another. We are currently interested in finding out how prevalent each symptom is among various groups of people. On the page below, write how frequently you experience each symptom. For all items, use the following scale:

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

For example, if your eyes tend to water once every week or two, you would answer "D" next to question #1.

- | | |
|---|---|
| <input type="checkbox"/> 1. Eyes water | <input type="checkbox"/> 28. Swollen joints |
| <input type="checkbox"/> 2. Itchy eyes or skin | <input type="checkbox"/> 29. Stiff or sore muscles |
| <input type="checkbox"/> 3. Ringing in ears | <input type="checkbox"/> 30. Back pains |
| <input type="checkbox"/> 4. Temporary deafness or hard of hearing | <input type="checkbox"/> 31. Sensitive or tender skin |
| <input type="checkbox"/> 5. Lump in throat | <input type="checkbox"/> 32. Face flushes |
| <input type="checkbox"/> 6. Choking sensations | <input type="checkbox"/> 33. Tightness in chest |
| <input type="checkbox"/> 7. Sneezing spells | <input type="checkbox"/> 34. Skin breaks out in rash |
| <input type="checkbox"/> 8. Running nose | <input type="checkbox"/> 35. Acne or pimples on face |
| <input type="checkbox"/> 9. Congested nose | <input type="checkbox"/> 36. Acne/pimples other than face |
| <input type="checkbox"/> 10. Bleeding nose | <input type="checkbox"/> 37. Boils |
| <input type="checkbox"/> 11. Asthma or wheezing | <input type="checkbox"/> 38. Sweat even in cold weather |
| <input type="checkbox"/> 12. Coughing | <input type="checkbox"/> 39. Strong reactions to insect bites |
| <input type="checkbox"/> 13. Out of breath | <input type="checkbox"/> 40. Headaches |
| <input type="checkbox"/> 14. Swollen ankles | <input type="checkbox"/> 41. Feeling pressure in head |
| <input type="checkbox"/> 15. Chest pains | <input type="checkbox"/> 42. Hot flashes |
| <input type="checkbox"/> 16. Racing heart | <input type="checkbox"/> 43. Chills |
| <input type="checkbox"/> 17. Cold hands or feet even in hot weather | <input type="checkbox"/> 44. Dizziness |
| <input type="checkbox"/> 18. Leg cramps | <input type="checkbox"/> 45. Feel faint |
| <input type="checkbox"/> 19. Insomnia or difficulty sleeping | <input type="checkbox"/> 46. Numbness or tingling in any part of body |
| <input type="checkbox"/> 20. Toothaches | <input type="checkbox"/> 47. Twitching of eyelid |
| <input type="checkbox"/> 21. Upset stomach | <input type="checkbox"/> 48. Twitching other than eyelid |
| <input type="checkbox"/> 22. Indigestion | <input type="checkbox"/> 49. Hands tremble or shake |
| <input type="checkbox"/> 23. Heartburn or gas | <input type="checkbox"/> 50. Stiff joints |
| <input type="checkbox"/> 24. Abdominal pain | <input type="checkbox"/> 51. Sore muscles |
| <input type="checkbox"/> 25. Diarrhea | <input type="checkbox"/> 52. Sore throat |
| <input type="checkbox"/> 26. Constipation | <input type="checkbox"/> 53. Sunburn |
| <input type="checkbox"/> 27. Hemorrhoids | <input type="checkbox"/> 54. Nausea |

Since the beginning of the semester, how many:

- Visits have you made to the student health center or private physician for illness
 Days have you been sick
 Days your activity has been restricted due to illness

APPENDIX G

PTSD CHECK LIST – SPECIFIC

PCL-S

The event you experienced was _____ on _____.
(event) (date)

INSTRUCTIONS: Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Repeated, disturbing <i>memories, thoughts, or images</i> of the stressful experience?	1	2	3	4	5
2. Repeated, disturbing <i>dreams</i> of the stressful experience?	1	2	3	4	5
3. Suddenly <i>acting or feeling</i> as if the stressful experience <i>were happening again</i> (as if you were reliving it)?	1	2	3	4	5
4. Feeling <i>very upset</i> when <i>something reminded you</i> of the stressful experience?	1	2	3	4	5
5. Having <i>physical reactions</i> (e.g., heart pounding, trouble breathing, sweating) when <i>something reminded you</i> of the stressful experience?	1	2	3	4	5
6. Avoiding <i>thinking about or talking about</i> the stressful experience or avoiding <i>having feelings</i> related to it?	1	2	3	4	5
7. Avoiding <i>activities or situations</i> because <i>they reminded you of</i> the stressful experience?	1	2	3	4	5
8. Trouble <i>remembering important parts</i> of the stressful experience?	1	2	3	4	5
9. <i>Loss of interest</i> in activities that you used to enjoy?	1	2	3	4	5
10. Feeling <i>distant or cut off</i> from other people?	1	2	3	4	5
11. Feeling <i>emotionally numb</i> or being unable to have loving feelings for those close to you?	1	2	3	4	5
12. Feeling as if your <i>future</i> will somehow be <i>cut short</i> ?	1	2	3	4	5
13. Trouble <i>falling or staying asleep</i> ?	1	2	3	4	5
14. Feeling <i>irritable</i> or having <i>angry outbursts</i> ?	1	2	3	4	5
15. Having <i>difficulty concentrating</i> ?	1	2	3	4	5
16. Being " <i>super-alert</i> " or watchful or on guard?	1	2	3	4	5
17. Feeling <i>jumpy</i> or easily startled?	1	2	3	4	5

PCL-S for DSM-IV (11/1/94) Weathers, Litz, Huska, & Keane National Center for PTSD - Behavioral Science Division

APPENDIX H

OUTCOME QUESTIONNAIRE 45.2

Outcome Questionnaire (OQ[®]-45.2)

Instructions: Looking back over the last week, including today, help us understand how you have been feeling. Read each item carefully and mark the box under the category which best describes your current situation. For this questionnaire, work is defined as employment, school, housework, volunteer work, and so forth. Please do not make any marks in the shaded areas.

Name: _____ Age: _____ yrs.
 Sex
 M F
 ID# _____

Session # _____ Date ____ / ____ / ____

	Almost					SD	IR	SR
	Never	Rarely	Sometimes	Frequently	Always	DO NOT MARK BELOW		
1. I get along well with others.	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0		<input type="checkbox"/>	
2. I tire quickly.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
3. I feel no interest in things.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
4. I feel stressed at work/school.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			<input type="checkbox"/>
5. I blame myself for things.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
6. I feel irritated.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
7. I feel unhappy in my marriage/significant relationship.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4		<input type="checkbox"/>	
8. I have thoughts of ending my life.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
9. I feel weak.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
10. I feel fearful.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
11. After heavy drinking, I need a drink the next morning to get going. (If you do not drink, mark "never")	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
12. I find my work/school satisfying.....	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0			<input type="checkbox"/>
13. I am a happy person.	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0	<input type="checkbox"/>		
14. I work/study too much.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			<input type="checkbox"/>
15. I feel worthless.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
16. I am concerned about family troubles.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
17. I have an unfulfilling sex life.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4		<input type="checkbox"/>	
18. I feel lonely.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4		<input type="checkbox"/>	
19. I have frequent arguments.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4		<input type="checkbox"/>	
20. I feel loved and wanted.....	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0		<input type="checkbox"/>	
21. I enjoy my spare time.	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0			<input type="checkbox"/>
22. I have difficulty concentrating.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
23. I feel hopeless about the future.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
24. I like myself.....	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0	<input type="checkbox"/>		
25. Disturbing thoughts come into my mind that I cannot get rid of.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
26. I feel annoyed by people who criticize my drinking (or drug use)..... (If not applicable, mark "never")	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
27. I have an upset stomach.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
28. I am not working/studying as well as I used to.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			<input type="checkbox"/>
29. My heart pounds too much.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
30. I have trouble getting along with friends and close acquaintances.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4		<input type="checkbox"/>	
31. I am satisfied with my life.	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0	<input type="checkbox"/>		
32. I have trouble at work/school because of drinking or drug use..... (If not applicable, mark "never")	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
33. I feel that something bad is going to happen.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
34. I have sore muscles.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
35. I feel afraid of open spaces, of driving, or being on buses, subways, and so forth.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
36. I feel nervous.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
37. I feel my love relationships are full and complete.	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0		<input type="checkbox"/>	
38. I feel that I am not doing well at work/school.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			<input type="checkbox"/>
39. I have too many disagreements at work/school.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			<input type="checkbox"/>
40. I feel something is wrong with my mind.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
41. I have trouble falling asleep or staying asleep.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
42. I feel blue.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
43. I am satisfied with my relationships with others.	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0		<input type="checkbox"/>	
44. I feel angry enough at work/school to do something I might regret.....	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
45. I have headaches.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4			
+ +								
Total=								

Developed by Michael J. Lambert, Ph.D. and Gary M. Burlingame, Ph.D.
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APPENDIX I
CONTROL GROUP INSTRUCTIONS

Day 1:

“During today’s writing session, I want you to describe in detail what you have done since you woke up this morning. It is important that you describe things exactly as they occurred. Do not mention your own emotions, feeling, or opinions. Your description should be as objective as possible.” (Pennebaker, Colder, Sharp, 1990)

Day 2:

“During today’s writing session, I want you to describe in detail what you plan to do for the next week?”

Day 3:

“During today’s writing session, I want you to describe in detail what you plan to do for the next month?”

APPENDIX J

STANDARD LINGUISTIC WRITING INSTRUCTIONS

Day 1:

“For the next three days, I would like for you to write about your very deepest thoughts and feelings about the most traumatic experience of your entire life. As you do this, I would like you to write with as much emotion as possible. All of your writing will be completely confidential. Do not worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up. In your writing, I want you to really let go and explore your very deepest emotions and thoughts. Please write about the same experience on all three days. In addition to a traumatic experience, you can also write about major conflicts or problems that you have experienced or are experiencing now. Whatever you choose to write, however, it is critical that you really delve into your deepest emotions and thoughts. Ideally, we would also like you to write about significant experiences or conflicts that you have not discussed in great detail with others. Remember that you have three days to write. You might tie your personal experiences to other parts of your life. How is it related to your childhood, your parents, people you love, who you are, or who you want to be? Again, in your writing, examine your deepest emotions and thoughts.”

Day 2:

“Welcome back, I would like you to continue to write about your very deepest thoughts and feelings about the most traumatic experience of your entire life with as much emotion as possible. I would also like you to continue to write about the same

trauma that you did yesterday. All of your writing will be completely confidential. Do not worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up.”

Day 3:

“Welcome back, today is your final day of writing. I would like you to continue to write about your very deepest thoughts and feelings about the most traumatic experience of your entire life with as much emotion as possible. As was the case yesterday, I would like you continue to write about the same trauma that you did yesterday. All of your writing will be completely confidential. Do not worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up.”

APPENDIX K

EMOTION SELF-REPORT INSTRUCTIONS AND FEEDBACK

Day 1: Standard Writing Instructions

“For the next three days, I would like for you to write about your very deepest thoughts and feelings about the most traumatic experience of your entire life. As you do this, I would like you to write with as much emotion as possible. All of your writing will be completely confidential. Do not worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, please continue to do so until your time is up. In your writing, I want you to really let go and explore your very deepest emotions and thoughts. Please write about the same experience on all three days. In addition to a traumatic experience, you can also write about major conflicts or problems that you have experienced or are experiencing now. Whatever you choose to write, however, it is critical that you really delve into your deepest emotions and thoughts. Ideally, we would also like you to write about significant experiences or conflicts that you have not discussed in great detail with others. Remember that you have three days to write. You might tie your personal experiences to other parts of your life. How is it related to your childhood, your parents, people you love, who you are, or who you want to be? Again, in your writing, examine your deepest emotions and thoughts.”

Day 2: Negative Emotional Expression

[ALL] Before you start writing, today I want to give you some feedback to make your writing more therapeutic. First, I would like you to take a moment and reflect on your own personal thoughts on emotional expression? How do you feel about expressing

emotion? Before you started writing on your first day, you answered some questions for us. These questions helped us to gain an understanding of how you view your world. I would like to give you some feedback based on that information. [/ALL]

According to the questionnaires you filed out, you seem to **[STRUGGLE WITH EXPRESSING/ BE ABLE TO EXPRESS/ EASILY EXPRESS from the BEQ_ALL]** your emotions. Specifically, with regard to expressing negative emotions, you have a **[EASIER TIME/HAVE A SIMILAR EXPERIENCE / HARDER TIME; note compare category from BEQ_ALL AND BEQ_NEG]** expressing this emotional experience. Furthermore, **[AND ONE OF THE FOLLOWING]**

[IF CESC_ANGER IS HIGHEST] in examining your responses to the questionnaires, I noticed that you have an easier time expressing your anger. Anger is often something we experience when our expectations have not been met or when someone or something has really let us down. Has that been the case for you? What role has anger played in your life since you first experienced the traumatic event you've been writing about? I wonder if you might also have had some feelings of sadness or anxiety that you could describe. Emotions such as sadness or anxiety can sometimes, but not always, underlie the experience of anger. Processing your full emotional experience can be beneficial to helping you find emotional resolution or closure. While you may always have the memory about a traumatic or stressful event, writing about it can reduce the impact that your negative emotions may have on you. I really would like you to focus on how you might have been feeling at the time. You could talk about how the stressful or traumatic experience made you feel. This might include feelings such as anger, fearfulness, or even sadness. If you are having trouble describing the exact emotion, try

to talk about how your body might feel as you think about that experience or you can write down any changes that you are experiencing as you tell me about this traumatic or stressful event. [/ANGER]

[IF CESC_ANXIETY IS HIGHEST] in examining your responses to the questionnaires, I noticed that you have an easier time expressing your anxiety and fear. Anxiety and fear are useful for helping us protect ourselves from things that might hurt us- physically or emotionally. Has that been the case for you? What role has anxiety or fear played in your life since you first experienced the traumatic event you've been writing about? Anxiety and fear can sometimes be accompanied by anger as well as sadness. I wonder if you could write a bit more about any feelings of sadness or anger you might have had. Processing your full emotional experience can be beneficial to helping you find emotional resolution or closure. While you may always have the memory about a traumatic or stressful event, writing about it can reduce the impact that your negative emotions may have on you. I would like you to focus on either how you might have been feeling at the time or how you are feeling now thinking about it now; either one is appropriate for this writing exercise. You could talk about how the stressful or traumatic experience made you feel, it might have been feelings such as anger, fearful, or even sadness. If you are having trouble describing the exact emotion, try to talk about how your body might feel as you think about that experience or you can, write down any changes that you are experiencing as you tell me about this traumatic or stressful event. [/ANXIETY]

[IF CESC_SADNESS IS HIGHEST] in examining your responses to the questionnaires, I noticed that you have an easier time expressing your sadness. Sadness

or depression often occurs when we feel events or situations are out of our control. It can be a sign that things are not going as planned, and these feelings can cue us in to changes that could make things better. Has that been the case for you? What role has sadness played in your life since you first experienced the traumatic event you've been writing about? Feelings of sadness or depression can sometimes be accompanied by anger, fear, and sadness. I wonder if you could write a bit more about any feelings of anxiety, fear, or anger you might have had. Processing your full emotional experience can be beneficial to helping you find emotional resolution or closure. While you may always have the memory about a traumatic or stressful event, writing about it can reduce the impact that your negative emotions may have on you. I would like you to focus on either how you might have been feeling at the time or how you are feeling now thinking about it now; either one is appropriate for this writing exercise. You could talk about how the stressful or traumatic experience made you feel, it might have been feelings such as anger, fearful, or even sadness. If you are having trouble describing the exact emotion, try to talk about how your body might feel as you think about that experience or you can, write down any changes that you are experiencing as you tell me about this traumatic or stressful event.

[/SADNESS]

[ELSE IF (SADNESS=ANXIETY=ANGER OR SADNESS=ANXIETY>ANGER OR SADNESS=ANGER>ANXIETY OR ANXIETY=ANGER>SADNESS) AND NEGEMO>0] in examining your responses to the questionnaires, I noticed that you can express all different kinds of negative emotions. This included feelings of anxiety, fear, sadness, and anger. The negative emotions that you wrote about experiencing can be influenced by many factors. Anger is often

something we experience when our expectations have not been met or when someone or something has really let us down. Anxiety and fear are useful for helping us protect ourselves from things that might hurt us- physically or emotionally. Sadness or depression often occurs when we feel events or situations are out of our control. Have any of these emotional experiences been the case for you? What role has sadness played in your life since you first experienced the traumatic event you've been writing about? It is no surprise that you seem to have multiple feelings about a single experience; feelings of anger, sadness, anxiety, and fear are all related to each other as well as going through a stressful or traumatic experience. Processing your full emotional experience can be beneficial to helping you find emotional resolution or closure. While you may always have the memory about a traumatic or stressful event, writing about it can reduce the impact that your negative emotions may have on you. I would like you to focus on either how you might have been feeling at the time or how you are feeling now thinking about it now; either one is appropriate for this writing exercise. You could talk about how the stressful or traumatic experience made you feel, it might have been feelings such as anger, fearful, or even sadness. If you are having trouble describing the exact emotion, try to talk about how your body might feel as you think about that experience or you can, write down any changes that you are experiencing as you tell me about this traumatic or stressful event. [/S=A=A] [/FOLLOWING]

[ALL] I want you to continue writing about the same trauma you did yesterday. As you write, I would like you to focus on your own emotional experience and where these feelings come from as you tell your story. It might be helpful to write about where you feel them in your body. Remember, all of your writing will be

completely confidential. Do not worry about spelling, sentence structure, or grammar.
The only rule is that once you begin writing; continue to do so until your time is up.

[/ALL]

Day 3: Positive Emotional Expression

Thank you for continuing to write each day and reflect upon what you are writing.
I would like to once again give you some more feedback based on the questionnaires you filled out the first day.

[IF BEQ_ALL=LOW] When I looked at the answers that you provided, you might be a person who struggles with expressing emotion.

[ELSE IF BEQ_ALL=AVERAGE] When I looked at the answers that you provided, you might be a person who is able to express their emotions.

[ELSE IF BEQ_ALL=HIGH] When I looked at the answers that you provided, you might be a person who can easily express their emotions. **[/BEQ_ALL]**

[EXAMINE POS & NEG]

[IF BEQ_POS=LOW & BEQ_NEG = LOW] You seem to have problems expressing both your positive and negative emotions. I wonder if you could try to focus on building this skill as you write today. You could write about how this experience has changed your perspective on life, how you have grown as a person, or how unintended positive things have resulted from this experience. You can still talk about some of the negative experiences in this writing session but in addition, I wonder if you could also try to find the silver lining or benefits that have resulted from this terrible experience.

[/LOW-LOW]

[IF BEQ_POS=LOW & BEQ_NEG=AVERAGE] You seem to have problems expressing both your positive emotions but are able to express your negative emotions. I wonder if you could try to focus on these positive emotions today in order to build up this skill. You could write about how this experience has changed your perspective on life, how you have grown as a person, or how unintended positive things have resulted from this experience. You can still talk about some of the negative experiences in this writing session but in addition, I wonder if you could also try to find the silver lining or benefits that have resulted from this terrible experience. **[/LOW-AVERAGE]**

[IF BEQ_POS=LOW & BEQ_NEG=HIGH] You seem to have problems expressing both your positive emotions but are easily able to express your negative emotions. It may be hard for you to change your perspective and focus on the positive but this is an important skill to have. You could write about how this experience has changed your perspective on life, how you have grown as a person, or how unintended positive things have resulted from this experience. You can still talk about some of the negative experiences in this writing session but in addition, I wonder if you could also try to find the silver lining or benefits that have resulted from this terrible experience. **[/LOW-HIGH]**

[IF BEQ_POS=AVERAGE & BEQ_NEG = LOW] You seem to have problems expressing your negative emotions but are able to express your positive emotions. I would like you to focus on expressing your positive emotions today. You could write about how this experience has changed your perspective on life, how you have grown as a person, or how unintended positive things have resulted from this experience. You can still talk about some of the negative experiences in this writing

session but in addition, I wonder if you could also try to find the silver lining or benefits that have resulted from this terrible experience. [/AVERAGE-LOW]

[IF BEQ_POS=AVERAGE & BEQ_NEG=AVERAGE] You seem to be able to express both your positive and negative emotions. I wonder if you could try to focus on these positive emotions today in order to continue to build up this skill. You could write about how this experience has changed your perspective on life, how you have grown as a person, or how unintended positive things have resulted from this experience. You can still talk about some of the negative experiences in this writing session but in addition, I wonder if you could also try to find the silver lining or benefits that have resulted from this terrible experience. [/AVERAGE-AVERAGE]

[IF BEQ_POS=AVERAGE & BEQ_NEG=HIGH] You seem to be able to express both your positive and negative emotions but are better able to express your negative emotions. It may be hard for you to change your perspective and focus on the positive but this is an important skill to have. You could write about how this experience has changed your perspective on life, how you have grown as a person, or how unintended positive things have resulted from this experience. You can still talk about some of the negative experiences in this writing session but in addition, I wonder if you could also try to find the silver lining or benefits that have resulted from this terrible experience. [/AVERAGE-HIGH]

[IF BEQ_POS=HIGH & BEQ_NEG = LOW] You seem to have problems expressing your negative emotions but are able to easily express your positive emotions. Today, I would like you to focus on expressing your positive emotions. You could write about how this experience has changed your perspective on life, how you have grown as

a person, or how unintended positive things have resulted from this experience. You can still talk about some of the negative experiences in this writing session but in addition, I wonder if you could also try to find the silver lining or benefits that have resulted from this terrible experience. **[/HIGH-LOW]**

[IF BEQ_POS=HIGH & BEQ_NEG=AVERAGE] You seem to be able to express both your positive and negative emotions, but you might find expressing your positive emotions a little easier. I wonder if you could try to focus on these positive emotions today in order to continue to refine this skill. You could write about how this experience has changed your perspective on life, how you have grown as a person, or how unintended positive things have resulted from this experience. You can still talk about some of the negative experiences in this writing session but in addition, I wonder if you could also try to find the silver lining or benefits that have resulted from this terrible experience. **[/HIGH-AVERAGE]**

[IF BEQ_POS=HIGH & BEQ_NEG=HIGH] You seem to be able to easily express both your positive and negative emotions. I would like you to focus on your positive emotional experiences. You could write about how this experience has changed your perspective on life, how you have grown as a person, or how unintended positive things have resulted from this experience. You can still talk about some of the negative experiences in this writing session but in addition, I wonder if you could also try to find the silver lining or benefits that have resulted from this terrible experience. **[/HIGH-HIGH]**

[ALL] Remember, today is your final day of writing. I would like you to continue to write about your very deepest thoughts and feelings about that traumatic

experience. All of your writing will be completely confidential. Do not worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up.”[**ALL**]

APPENDIX L
LINGUISTIC INQUIRY AND WORD COUNT INSTRUCTIONS
AND FEEDBACK

Day 1: Standard Writing Instructions

“For the next three days, I would like for you to write about your very deepest thoughts and feelings about the most traumatic experience of your entire life. As you do this, I would like you to write with as much emotion as possible. All of your writing will be completely confidential. Do not worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, please continue to do so until your time is up. In your writing, I want you to really let go and explore your very deepest emotions and thoughts. Please write about the same experience on all three days. In addition to a traumatic experience, you can also write about major conflicts or problems that you have experienced or are experiencing now. Whatever you choose to write, however, it is critical that you really delve into your deepest emotions and thoughts. Ideally, we would also like you to write about significant experiences or conflicts that you have not discussed in great detail with others. Remember that you have three days to write. You might tie your personal experiences to other parts of your life. How is it related to your childhood, your parents, people you love, who you are, or who you want to be? Again, in your writing, examine your deepest emotions and thoughts.”

Day 2: Negative Emotional Expression

[ALL]

Before you start writing, today I want to give you some feedback to make your writing more beneficial. First, I would like you to take a moment and think about what you wrote in the first writing session. Could you tell me what types of emotions were you feeling? [/ALL]

[IF NEGEMO = 0] I noticed that you did not seem to express any negative emotion in your previous writing. I would really encourage you to tune into your emotional experience. I really would like you to focus on how you might have been feeling at the time. You could talk about how the stressful or traumatic experience made you feel, it might have been feelings such as anger, fearful, or even sadness. If you are having trouble describing the exact emotion, try to talk about how your body might feel as you think about that experience. Do you notice that you feel certain pressure or tension? Feel free to write down any changes that you are experiencing as you tell me about this traumatic or stressful event. [/NEGEMO=0]

[ELSE IF NEGEMO > 0] I noticed that you used [FEW / A FAIR NUMBER / MANY] words like [INSERT SPECIFIC NEGATIVE EMOTION WORDS USED]. Furthermore, [AND ONE OF THE FOLLOWING]

[ELSE IF ANGER IS HIGHEST] as I read your essay, I noticed that you seemed to write about more of your anger than other emotions. Anger is often something we experience when our expectations have not been met or when someone or something has really let us down. Has that been the case for you? What role has anger played in your life since you first experienced the traumatic event you've been writing about? I wonder if you might also have had some feelings of sadness or anxiety that you could describe. Emotions such as sadness or anxiety can sometimes, but not always, underlie

the experience of anger. Processing your full emotional experience can be beneficial to helping you find emotional resolution or closure. While you may always have the memory about a traumatic or stressful event, writing about it can reduce the impact that your negative emotions may have on you. I really would like you to focus on how you might have been feeling at the time. You could talk about how the stressful or traumatic experience made you feel. This might include feelings such as anger, fearfulness, or even sadness. If you are having trouble describing the exact emotion, try to talk about how your body might feel as you think about that experience or you can write down any changes that you are experiencing as you tell me about this traumatic or stressful event.

[/ANGER]

[ELSE IF ANXIETY IS HIGHEST] as I read your essay, I noticed that you seemed to write about more of your anxiety or fear, than other emotions. Anxiety and fear are useful for helping us protect ourselves from things that might hurt us- physically or emotionally. Has that been the case for you? What role has anxiety or fear played in your life since you first experienced the traumatic event you've been writing about? Anxiety and fear can sometimes be accompanied by anger as well as sadness. I wonder if you could write a bit more about any feelings of sadness or anger you might have had. Processing your full emotional experience can be beneficial to helping you find emotional resolution or closure. While you may always have the memory about a traumatic or stressful event, writing about it can reduce the impact that your negative emotions may have on you. I would like you to focus on either how you might have been feeling at the time or how you are feeling now thinking about it now; either one is appropriate for this writing exercise. You could talk about how the stressful or traumatic

experience made you feel, it might have been feelings such as anger, fearful, or even sadness. If you are having trouble describing the exact emotion, try to talk about how your body might feel as you think about that experience or you can, write down any changes that you are experiencing as you tell me about this traumatic or stressful event.

[/ANXIETY]

[ELSE IF SADNESS IS HIGHEST] as I read your essay, I noticed that you seemed to write about more of your sadness or depressive feelings than other emotions. Sadness or depression often occurs when we feel events or situations are out of our control. It can be a sign that things are not going as planned, and these feelings can cue us in to changes that could make things better. Has that been the case for you? What role has sadness played in your life since you first experienced the traumatic event you've been writing about? Feelings of sadness or depression can sometimes be accompanied by anger, fear, and sadness. I wonder if you could write a bit more about any feelings of anxiety, fear, or anger you might have had. Processing your full emotional experience can be beneficial to helping you find emotional resolution or closure. While you may always have the memory about a traumatic or stressful event, writing about it can reduce the impact that your negative emotions may have on you. I would like you to focus on either how you might have been feeling at the time or how you are feeling now thinking about it now; either one is appropriate for this writing exercise. You could talk about how the stressful or traumatic experience made you feel, it might have been feelings such as anger, fearful, or even sadness. If you are having trouble describing the exact emotion, try to talk about how your body might feel as you think about that experience or you can,

write down any changes that you are experiencing as you tell me about this traumatic or stressful event. [/SADNESS]

[ELSE IF (SADNESS=ANXIETY=ANGER OR SADNESS=ANXIETY>ANGER OR SADNESS=ANGER>ANXIETY OR ANXIETY=ANGER>SADNESS) AND NEGEMO>0] as I read your essay, I noticed that you were able to share a lot about the different kinds of negative emotions you were feeling. This included feelings of anxiety, fear, sadness, and anger. The negative emotions that you wrote about experiencing can be influenced by many factors. Anger is often something we experience when our expectations have not been met or when someone or something has really let us down. Anxiety and fear are useful for helping us protect ourselves from things that might hurt us- physically or emotionally. Sadness or depression often occurs when we feel events or situations are out of our control. Have any of these emotional experiences been the case for you? What role has sadness played in your life since you first experienced the traumatic event you've been writing about? It is no surprise that you seem to have multiple feelings about a single experience; feelings of anger, sadness, anxiety, and fear are all related to each other as well as going through a stressful or traumatic experience. Processing your full emotional experience can be beneficial to helping you find emotional resolution or closure. While you may always have the memory about a traumatic or stressful event, writing about it can reduce the impact that your negative emotions may have on you. I would like you to focus on either how you might have been feeling at the time or how you are feeling now thinking about it now; either one is appropriate for this writing exercise. You could talk about how the stressful or traumatic experience made you feel, it might have been feelings such as

anger, fearful, or even sadness. If you are having trouble describing the exact emotion, try to talk about how your body might feel as you think about that experience or you can, write down any changes that you are experiencing as you tell me about this traumatic or stressful event. [/S=A=A] [/FOLLOWING]

[ALL] I want you to continue writing about the same trauma you did yesterday. As you write, I would like you to focus on your own emotional experience and where these feelings come from as you tell your story. It might be helpful to write about where you feel them in your body. Remember, all of your writing will be completely confidential. Do not worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing; continue to do so until your time is up.

[/ALL]

Day 3: Positive Emotional Expression

Thank you for continuing to write each day and reflect upon what you are writing. Once again, I would like you to think about your last writing session and how you were feeling about that session and about the emotions that you shared in your writing. Yesterday I asked you to focus on your negative emotional expression

[IF NEGEMO1+NEGEMO2=0] and again, I noticed that you did not seem to express any negative emotion in your two previous writing. I would really encourage you to tune into your emotional experience. Today, I would like to focus on any positive feelings that may have resulted from this experience. [/NEGEMO=0]

[IF NEGEMO2<=NEGEMO1 THEN NO SUCCESS] and you had a similar amount of negative emotion from your first day of writing. [/NO SUCCESS]

[ELSE IF NEGEMO2>NEGEMO1 THEN SUCCESS] and you were successful in getting out on paper the negative emotions that you have been feeling surrounding that traumatic or stressful event. **[/SUCCESS]**

[AND (USE FOR BOTH SUCCESS AND NO SUCCESS)]

[IF WRITING_1+2_ANGER IS HIGHEST] Over the past two days, you have written the most about your anger. I have noticed words such as **[INSERT SPECIFIC ANGER WORDS USED]** in your writing. I am glad that you were able to express your feelings of anger. Today, I would like to focus on any positive feelings that may have resulted from this experience. With regards to your anger, it might be helpful to write about how your life has changed or what changes you would need to make to feel less angry more happiness and joy. You can write about the feelings themselves, how you feel inside, or any body sensations that are related to any positive feelings. **[/ANGER]**

[ELSE IF WRITING_1+2_ANXIETY IS HIGHEST] Over the past two days, you have written the most about your anxiety or fear. I have noticed words such as **[INSERT SPECIFIC ANXIETY WORDS USED]** in your writing. I am glad that you were able to express your feelings of anxiety and fear. Today, I would like to focus on any positive feelings that may have resulted from this experience. With regards to your anxiety or fear, it might be helpful to write about how these feelings have changed or what changes you might need to make in order to feel less anxious or fearful and more happiness and joy. Remember that you can write about your emotions at the time of the original experience or how you feel right now looking back. You can write about the feelings themselves, how you feel inside, or any body sensations that are related to any positive feelings. **[/ANXIETY]**

[ELSE IF WRITING_1+2_SADNESS IS HIGHEST] Over the past two days, you have written the most about your sadness. I have noticed words such as **[INSERT SPECIFIC SADNESS WORDS USED]** in your writing. I am glad that you were able to express your feelings of depression and sadness. Today, I would like to focus on any positive feelings that may have resulted from this experience. With regards to your sadness, it might be helpful to write about how your life has changed or what changes you would need to make to feel less sadness and more happiness and joy. Remember that you can write about your emotions at the time of the original experience or how you feel right now looking back. You can write about the feelings themselves, how you feel inside, or any body sensations that are related to any positive feelings. **[/SADNESS]**

[ELSE IF WRITING_1+2_(SADNESS=ANXIETY=ANGER OR SADNESS=ANXIETY>ANGER OR SADNESS=ANGER>ANXIETY OR ANXIETY=ANGER>SADNESS) AND NEGEMO>0] Over the past two days, you wrote about many of your negative emotions such as anger, anxiety, fear, and sadness. I have noticed words such as **[INSERT SPECIFIC NEGEMO1+2 WORDS USED]** in your writing. I am glad that you were able to express these negative emotions. Today, I would like to focus on any positive feelings that may have resulted from this experience. With regards to your negative emotions, it might be helpful to write about how your life has changed or what changes you would need to feel less negative emotions and more happiness and joy. Remember that you can write about your emotions at the time of the original experience or how you feel right now looking back. You can write about the feelings themselves, how you feel inside, or any body sensations that are related to any positive feelings. **[/S=A=A][/AND]**

But before you get started writing again, I would like to give you a little feedback on the positive emotions that you shared with me. In looking over your two previous essays,

[IF POSEMO1+POSEMO2=0] you hardly used any positive emotions in describing the events. **[/IF]**

[IF POSEMO1+POSEMO2=0] Many individuals find it hard to write about the positive aspects of their experience, let me give you some ways that might help you. You could write about how this experience has changed your perspective on life, how you have grown as a person, or how unintended positive things have resulted from this experience. You can still talk about some of the negative experiences in this writing session; however, try to find the silver lining or benefits that have resulted from this stressful or traumatic experience. **[/P=0]**

[IF POSEMO1+POSEMO2>0] you used **[FEW / A FAIR NUMBER / MANY]** words like **[INSERT SPECIFIC POSITIVE EMOTION WORDS USED]**. **[/P>0]**

[IF POSEMO1+POSEMO2>0 AND (POSEMO1+POSEMO2)<(NEGEMO1+NEGEMO2)] My guess is that it has been hard for you to focus on the positive parts of your experience. I was wondering if you could consider a little about how this negative experience has resulted in a new perspective in life. You might also consider writing about how you have grown as a person, or how unintended positive things have resulted from this experience. You can still talk about some of the negative experiences in this writing session; however, try to

find the silver lining or benefits that have resulted from this stressful or traumatic experience. [/P<N]

**[IF POSEMO1+POSEMO2>0 AND
(POSEMO1+POSEMO2)>(NEGEMO1+NEGEMO2)]**

When I look at your writing I cannot help but think that you have been able to see some of the positive aspects of your experience. You were able to write about them despite our suggestion to write about your negative emotions. This may be showing some of your inherent resilience. I would like you to continue to write about how this experience has helped you grow as a person and the unintended positive things that have resulted. [/P>N]

[ALL] You can write about your emotions at the time of the original experience or how you feel right now looking back. You can write about the feelings themselves, how you feel inside, or any body sensations that are related to any positive feelings. Remember, today is your final day of writing. I would like you to continue to write about your very deepest thoughts and feelings about that traumatic experience. All of your writing will be completely confidential. Do not worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up.”[/ALL]

APPENDIX M
THERAPIST INSTRUCTIONS AND FEEDBACK

Day 1: Standard Writing Instructions

“For the next three days, I would like for you to write about your very deepest thoughts and feelings about the most traumatic experience of your entire life. As you do this, I would like you to write with as much emotion as possible. All of your writing will be completely confidential. Do not worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up. In your writing, I want you to really let go and explore your very deepest emotions and thoughts. Please write about the same experience on all three days. In addition to a traumatic experience, you can also write about major conflicts or problems that you have experienced or are experiencing now. Whatever you choose to write, however, it is critical that you really delve into your deepest emotions and thoughts. Ideally, we would also like you to write about significant experiences or conflicts that you have not discussed in great detail with others. Remember that you have three days to write. You might tie your personal experiences to other parts of your life. How is it related to your childhood, your parents, people you love, who you are, or who you want to be? Again, in your writing, examine your deepest emotions and thoughts.”

Day 2: Negative Emotional Expression

Opening Statement (must be this text): “Before you start writing today, I want to give you some feedback to make your writing more beneficial. First, I would like you to

take a moment and think about what you wrote in the first writing session. Could you tell me what types of emotions were you feeling?”

Summary Statement. The summary statement shows the participant that the therapist has read their essay. You might want to think about describing a few specific details of what the participant wrote. An example includes: “I noticed that you spent a considerable amount of time writing about your experience of _____.”

Empathy Statement. The empathy statement is aimed to deliver empathic attunement to the participant and highlight any emotions, which have been displayed in their writing. You are also welcome to demonstrate empathy by highlighting something that might have been overlooked, but is validating (e.g., I can only imagine that being scared night after night could be very exhausting.)

Feedback statement based on EFT. The feedback statement allows the therapist to give advice and feedback to provide encouragement to the participant, give them guidance, and make the experiment more meaningful to them. One of the primary goals in our feedback here is to try and help the participant first be aware of how they feel (if that isn’t already demonstrated in their writing) and to then use those feelings to help them make sense out of past trauma, current way of looking at it, and best ways to proceed. Using examples from Elliott et al. (2004), look for the following levels of expression and provide a response that might likely lead the participant to the next level of expression:

- Level 1: The client’s content or manner of expression is impersonal, abstract, and general. Feelings are avoided, and personal involvement is absent from communication.

- Level 2: The association between the client and the content is clear. The client's involvement, however, does not go beyond the specific situation or content.
- Level 3: The content is narrative or description of the client in external or behavioral terms, with added comments on feelings or personal reactions.
- Level 4: The quality of involvement clearly shifts the client's attention to the subjective felt flow of experience, rather than to events or abstractions.
- Level 5: The client defines and internally elaborates a problem or question about the self.
- Level 6: The client synthesizes new feelings and meanings discovered in ongoing explorations to resolve current problems.
- Level 7: At this rarely attained level, the client achieves steady and expanding awareness of immediately present feelings and internal processes, linking and integrating felt nuances of experience as they occur in the present moment.

Here are some aspects of their writing that you can use in giving your feedback statement

- Participant not following experimental directions
- Participant having low emotional expression in the face of facts that would generally seem to elicit emotion. Therapist could then give them guidance on how to improve
- Participant focusing upon facts of the story rather than feeling
- Participant not describing emotions relative to their experience and instead emotions relative to the experience of other people
- Participant describing emotions that do not, on the surface, seem to correspond to the situation. Assumption should not be made that a participant is distancing

themselves from the emotion, but therapist should try and gain understanding around this.

- Provide encouragement to continue expressing emotion if the participant has displayed emotion that on the surface seems to be indicated given what they have described as the incident.

Closing Statement/Instructions (Must be this text): “I want you to continue writing about the same trauma you did yesterday. As you write, I would like you to focus on your own emotional experience and where these feelings come from as you tell your story. It might be helpful to write about where you feel them in your body. Remember, all of your writing will be completely confidential. Do not worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing; continue to do so until your time is up.”

Therapist should try to focus feedback to elicit negative emotion from the participant next writing session.

Day 3: Positive Emotional Expression

Opening Statement (must be this text): “Thank you for continuing to write each day and reflect upon what you are writing. Once again, I would like you to think about your last writing session and how you were feeling about that session and about the emotions that you shared in your writing. Yesterday I asked you to focus on your negative emotional expression.”

Summary Statement. The summary statement shows the participant that the therapist has read their essay. You might want to think about describing a few specific details of what the participant wrote.

Empathy Statement. The empathy statement is aimed to deliver empathic attunement to the participant and highlight any emotions, which have been displayed in their writing. You are also welcome to demonstrate empathy by highlighting something that might have been overlooked, but is validating (e.g., I can only imagine that being scared night after night could be very exhausting.)

Feedback statement based on EFT. The feedback statement allows the therapist to give advice and feedback to provide encouragement to the participant, give them guidance, and make the experiment more meaningful to them. One of the primary goals in our feedback here is to try and help the participant first be aware of how they feel (if that isn't already demonstrated in their writing) and to then use those feelings to help them make sense out of past trauma, current way of looking at it, and best ways to proceed. Using examples from Elliott et al. (2004), look for the following levels of expression and provide a response that might likely lead the participant to the next level of expression:

- Level 1: The client's content or manner of expression is impersonal, abstract, and general. Feelings are avoided, and personal involvement is absent from communication.
- Level 2: The association between the client and the content is clear. The client's involvement, however, does not go beyond the specific situation or content.
- Level 3: The content is narrative or description of the client in external or behavioral terms, with added comments on feelings or personal reactions.
- Level 4: The quality of involvement clearly shifts the client's attention to the subjective felt flow of experience, rather than to events or abstractions.

- Level 5: The client defines and internally elaborates a problem or question about the self.
- Level 6: The client synthesizes new feelings and meanings discovered in ongoing explorations to resolve current problems.
- Level 7: At this rarely attained level, the client achieves steady and expanding awareness of immediately present feelings and internal processes, linking and integrating felt nuances of experience as they occur in the present moment.

Here are some aspects of their writing that you can use in giving your feedback statement

- Participant not following experimental directions
- Participant having low emotional expression in the face of facts that would generally seem to elicit emotion. Therapist could then give them guidance on how to improve or shift away from just the expression of negative emotion.
- Participant focusing upon facts of the story rather than feeling
- Participant not describing emotions relative to their experience and instead emotions relative to the experience of other people
- Participant describing emotions that do not, on the surface, seem to correspond to the situation. Assumption should not be made that a participant is distancing themselves from the emotion, but therapist should try and gain understanding around this.
- Provide encouragement to continue expressing emotion if the participant has displayed emotion that on the surface seems to be indicated given what they have described as the incident.

Closing Statement (Must be this text): You can write about your emotions at the time of the original experience or how you feel right now looking back. You can write about the feelings themselves, how you feel inside, or any body sensations that are related to any positive feelings. Remember, today is your final day of writing. I would like you to continue to write about your very deepest thoughts and feelings about that traumatic experience. All of your writing will be completely confidential. Do not worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up.”

Therapist should try to focus feedback to elicit positive emotion from the participant next writing session.

APPENDIX N
CONSENT DOCUMENT



UNIVERSITY OF HAWAII
CANCER CENTER

Physical and Mental Health changes in an Expressive Writing Paradigm

Purpose and Procedures

You have been invited to participate in an online research study on expressive writing. We are interested in evaluating the effects of writing on health. The study is being conducted by an assistant professor at the University of Hawaii Manoa, Dr. Erin Bantum (University of Hawaii Cancer Center Prevention and Control program), a professor at Loma Linda University, Dr. Jason Owen, and his graduate student, Eric Hanson. This study has been approved by the University of Hawaii Committee on Human Studies.

We anticipate that between 300 and 500 people will participate in this study, including undergraduate students from the University of Hawaii at Manoa, as well as participants recruited electronically will participate in the project. If you choose to participate in the experiment, you will be asked to write about either events of your day or your deepest thoughts and feelings for 20 minutes a day, three days in a row. Before beginning the study, we will ask you for limited background information concerning yourself. We will also ask you to fill out a set of online questionnaires that will take about 30 minutes to complete. Upon completion of the online questionnaires, you will be randomized to one of five conditions, you will be asked to read instructions, and complete writing sessions on three consecutive days in the coming week. The instructions may vary between conditions. During each of the three writing sessions you will be asked to spend a few minutes reading a set of brief instructions and write non-stop for a full 20 minutes (total time each day 30 minutes). One month after you finish the third writing session, you will be asked to complete a few extra questionnaires. Finally, after completing the writing sessions, you will be asked to fill out a few follow up questionnaires, similar to the initial ones, which will take 20-40 minutes to complete. We estimate that the total time you will spend engaged in this study will be 2 hours and 30 minutes over the course of a 33-day period. Should you feel uncomfortable while completing a questionnaire or while writing, you may stop at any time and discontinue participation in the study.

The three writing sessions will be conducted through your computer. We encourage you to find a computer that affords you some degree of privacy so you can write freely and without distraction. Each of your writing sessions will be stored on a password-protected, secure website, and will not be visible to anyone except you and the study investigators and research team. The information you provide will only be linked with a subject identification number. You will select a username and password, which will allow access to the secure study website where you will type your entries. Your information will be kept confidential; however, we will attempt to contact you by e-mail to remind you when it is time to write or complete a questionnaire, give

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#5120036 Chair R. J. Ragland MD*

you your electronic gift card for completing the study, as well as in the event that we learn of a threat to your safety or the safety of someone else.

Risks and Discomforts

Risks associated with participation in the experiment are expected to be minimal and are likely to be only those experienced in everyday life. Writing about traumatic experiences may make you feel depressed for a short time, but this is completely normal. We encourage you to contact one of the primary investigators if you are feeling distressed as a result of participation. You are also welcome to discontinue participation should you feel that it is in your best interest to do so. You are welcome to contact one of the study investigators should you decide to withdraw or would like to discuss the study, although you may drop out of the study without contacting an investigator.

Any information submitted via the Internet may not be secure. Confidentiality of personal information that you submit over the Internet cannot be guaranteed. However, efforts to protect your confidentiality will be taken by 1) providing you with a password that prevents you from having to supply identifying information, such as your name; and 2) enforcing security procedures on the computer that hosts the website on which you will complete the surveys, to prevent access by anyone except the researchers involved with this study.

Benefits

There might not be any personal benefit to participating in this study. However, research has shown that writing can help some individual's process emotions. Furthermore, your participation may provide valuable information about how to improve psychological well-being among individuals who experienced a threatening or traumatic event.

Extra Credit

If you are a UHM student, you may receive extra credit in a Psychology class of your choice (at your instructor's discretion). At the end of the experiment, you will be able to print out a certificate stating that you have completed the study. You can then take this certificate to the Peer Advising Center for a final stamped validation, after which you can turn it in to your instructor for extra credit.

Participants' Rights

Participation in this study is completely voluntary. Your decision whether or not to participate or terminate at any time will not affect your present or future grades. The website allows for you to completely withdrawal from the study and the investigators will not contact you in the future. Additionally, no one will know about your participation in the study in less you want this information released.

Significant New Findings

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Any significant new findings that develop during the course of this study, which may affect your willingness to continue in the research, will be provided to you by the investigators.

Confidentiality

The information gathered during this study will be kept confidential. At the start of the study, you will be provided with information concerning how to maintain your privacy when participating in the experiment. At no time will you ever be asked to provide your real name, your address, or any other personal information without your consent.

If during one of the writing assignments you indicate that you have plans to harm yourself or someone else we will get in touch with you to provide you with contact information for a mental health professional. Confidentiality will not be maintained should it be felt that you and/or someone else is at risk of being harmed.

The results of this study, including your responses to the questionnaires, may be published for scientific purposes. However, your data will be combined with the data obtained from other participants in the study, and the identity of individual participants will never be revealed. You will be assigned a username and password. All of the information you provide will be identified by the number, rather than by your name. A list linking names and identification numbers will be kept in a locked file cabinet to which only the primary investigators have access, as a means of protecting your confidentiality. Furthermore, only the investigators will have access to your responses to the surveys.

Costs to Participants/Payment for Participation

There will be no cost to you for participation in the research study. Compensation in the form of a \$10 electronic gift card (i.e., amazon) will be given for completion only if the follow up measures (after 4 weeks) are completed.

Questions

If you have any questions about the research study or your participation in the study, you may feel free to contact Dr. Erin Bantum at any time prior to agreeing to participate or at any time during the study. Dr. Bantum can be reached by telephone at (808) 441-3491 or by email at ebantum@crch.hawaii.edu.

If you are not satisfied with the manner in which this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a study subject, please contact Committee on Human Subjects Studies (CHS), University of Hawaii, 1960 East-West Road, Biomed B-104, Honolulu, HI 96822. CHS phone number: (808) 956-5007.

Psychological Services

If, as a result of participation in this study, you would like to speak with a mental health professional you are encouraged to do so. The University of Hawaii Manoa Counseling Services

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(808) 956-7927, or a mental health professional in your community. The University of Hawaii at Manoa Counseling Services Clinic offers free counseling to full-time University of Hawaii at Manoa Students. The study website also has links to help you find a mental health professional in your community.

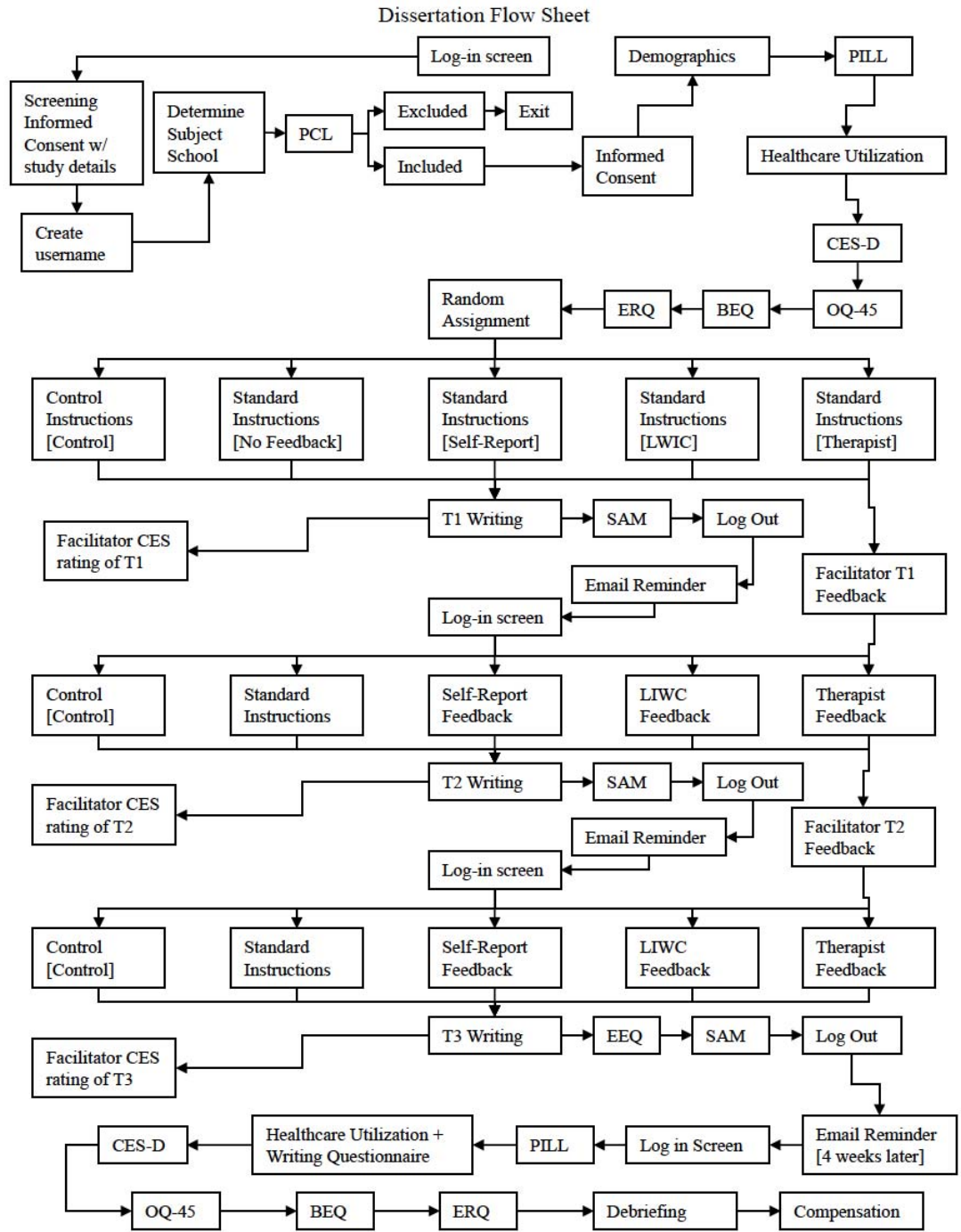
Informed Consent Statement

By clicking the "Agree" button below, I acknowledge that I have been informed of, and that I understand, the nature and purpose of this study, and I freely consent to participate. I also acknowledge that I am at least 18 years of age. Giving my consent does not waive my rights nor does it release the investigators, institution or sponsors from their responsibilities. I may call Erin Bantum, Ph.D., at (808) 441-3491 if I have additional questions or concerns.

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APPENDIX O

WEBSITE FLOW SHEET



APPENDIX P

DEBRIEFING STATEMENT

Thank you for taking the time to participate in our study. You have helped us learn more about the writing of traumatic experiences by college students.

This study was designed to see if specific feedback increased participants' emotional expression and depth of processing on subsequent writing sessions as well as any positive effect on physical and mental health. You were assigned to either: control group, standard linguistic writing group, self-reported feedback group, computer assisted feedback group, or a therapist feedback group. In the control group, you were asked to write about your day; in the standard linguistic writing group, you were asked to write about a traumatic event; in the self-report feedback group you wrote about a traumatic event but were then given feedback to improve based upon a measure you filled out on the first day; in the computer assisted feedback group, you were given feedback based on a computer programs scan of your essay; finally, in the therapist feedback group you were given feedback based upon a therapists advice to help you improve your writing.

As a result of participation in this study, you might find that you would like to speak with a mental health professional you are encouraged to do so. You can contact the Cal State San Bernardino Psychological Services Clinic (909) 537-5241, the Loma Linda University Psychological Services Clinic (909) 558-8576, or a mental health professional in your community.

Thanks again for participating in our study. Please feel free to contact Dr Jason Owen if you have any questions in the future. He can be reached at (909) 558-7705. You are also welcome to contact an impartial third party not associated with this study regarding any question or complaint you may have about the study. You may contact the Office of Patient Relations, Loma Linda University Medical Center, Loma Linda, CA 92354, phone (909) 558-4647 for information and assistance.