

ANALYSIS OF WRITTEN EMOTIONAL DISCLOSURE AND CONTROL GROUP
ESSAY ORGANIZATION IN BREAST CANCER SURVIVORS

WITH STAGE II LYMPHEDEMA

By

Liz McDowell

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Approved:

Professor Kenneth A. Wallston

Professor Sheila H. Ridner

Professor Vaughn G. Sinclair

Professor Lois Wagner

Professor Amy-Jill Levine

To my amazing children, Maurie, Courtenay, Elizabeth and Brandon who lovingly
encouraged and challenged me to rewrite my own life narrative
and
to Clara, who redefines life

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CHAPTER I

INTRODUCTION

The term *written emotional disclosure* (WED) refers to the various writing tasks used by current and past researchers that involve purposeful expressions of emotions and cognitive components of self-reflection and language processing through writing. While most researchers have found written emotional disclosure to be beneficial for psychological health, physical health, and overall functioning in certain populations, no one has definitively ascertained how or why this intervention results in positive changes. Theories continue to be explored in an attempt to explain why and/or how WED works, with no totally satisfactory consensus on which mechanisms are responsible for the results. Attention toward understanding the mechanisms (i.e., mediators) underlying the written disclosure paradigm, as well as the types of persons (i.e., moderators) who would benefit from its use, is critically needed.

Generally, my research deals with the questions: Does the organization (i.e., the coherence and cohesion) of written essays, or the development of this organization over time, influence the health benefits of writing? Can health-inducing writing styles be isolated? If we can identify health-inducing writing styles, then we can possibly train people to write in this manner, thus improving the effect size in our research studies as well as maximizing the benefits of engaging in the writing task.

My dissertation begins with a brief history of WED research. Then I define key concepts involved in working with WED texts, discuss the significance of WED to

individuals, society, healthcare, and nursing, and analyze theoretical and methodological approaches used in studying the effects of WED.

The second chapter presents a synthesis of current knowledge regarding written emotional disclosure with a particular emphasis on the analyses of WED essays. Because of the large number of studies that have been conducted since Pennebaker and Beall (58) began written emotional disclosure work more than 25 years ago, I focus on studies published within the past twelve years, when researchers began looking more closely at the narratives of the essays. I also include some of the methodological information obtained by Frattaroli (20) in her meta-analysis of 146 WED randomized studies.

In the third chapter, I list my particular research questions followed by a detailed discussion of my methodological approach for answering these questions. This discussion includes: the research design and assumptions; a description of the research setting; a description of the sample and data collection methods; and my plan for analyzing the data.

The fourth chapter details the results of my data analyses and the last chapter is devoted to a discussion of the meaning of my findings in relation to my hypotheses. In this fifth chapter I also discuss the significance of my research as well as its limitations. Finally, I outline my recommendations for future research studies in the area of written emotional disclosure.

A Brief History

Early research using written emotional disclosure as an intervention began with James Pennebaker and his student, Sandy Beall, in the mid-1980s (56, 58). They conducted

research with healthy college students and university employees and used a relatively uniform format. Participants wrote in a lab for three to five sessions of 15 to 20 minutes each, and were randomly assigned to write with emotion about a trauma or stressful event or to write without emotion about a neutral topic (20). Researchers measured participants on a variety of variables before randomization and again several days, weeks, or months after the disclosure sessions.

After a decade of research on healthy college students and university employees, researchers began to study samples of people who were currently experiencing or had previously experienced upsetting events. Researchers then branched out even more, testing the written emotional disclosure intervention on people with medical ailments including rheumatoid arthritis, asthma, migraine headaches, and cancer (20, 142, 143). More recently, researchers have begun to test the intervention with participants who have psychiatric and psychological problems (20). Beginning with the creation of the Linguistic Inquiry Word Count (LIWC) computer program designed to analyze quantitatively the linguistic content of written narratives (61), researchers throughout the past twelve years have become more interested in the narrative analyses of the written essays of research participants. Preliminary results of this focus suggest that some ways of writing are more likely to yield health improvements than others (56).

Many researchers found WED to be beneficial for psychological health, physical health, and overall functioning (e.g., 1, 4-5, 9, 11-12, 16-18, 20-21, 24, 27, 29, 32-37, 39, 41, 44-45, 51-53, 64, 68, 75-77, 79-82, 85-87, 89, 93, 97-99, 115, 121-122, 127-129, 131-132, 135, 143). However, some studies found mixed, limited or no beneficial effects of WED, particularly in populations with a history of exposure to psychological stress (e.g., 3, 7, 13, 25-26, 31, 37, 71, 86, 94, 121, 129, 131, 133, 141, 142). Over

200 expressive writing studies have now been published (84). These studies were conducted on a wide range of participants, using varied instructions, settings, outcome measures, and theoretical frameworks (84). The most recent and comprehensive meta-analysis by Frattaroli (20) indicated that the overall effect size of expressive writing is a Cohen's d around .08 (84). Such an effect size is usually viewed as almost insignificant. However, for any intervention, particularly such a brief and inexpensive one, to have an effect on meaningful outcome several weeks later is actually impressive (84).

While most researchers conclude that WED promotes health benefits in certain populations, no one has definitively determined how this strategy results in positive changes (20, 28, 32, 137). Methodological differences among studies as well as individual differences among participants probably contribute to differences in the effectiveness of WED in experimental studies (20).

Key Concepts

Within any research paradigm it is important to identify and define key concepts and terminology, particularly terms that may have multiple uses and meanings. In this section the term *written emotional disclosure* (WED) is discussed. Then several text analysis methodologies used in the written emotional disclosure research are briefly defined. And finally, how the term *narrative analysis* is used throughout this paper is clarified.

Written Emotional Disclosure

The myriad of research studies conducted in the area of written emotional disclosure produced varying terms to describe the intervention: expressive writing (e.g., 3, 5, 8, 13, 16, 18, 19, 21-22, 28-29, 31, 33, 37, 40, 43, 45, 48, 53, 57, 71, 76, 82, 84, 85, 87, 93, 96, 98, 115-118, 120, 122, 125, 128-130, 132, 137, 143); written emotional disclosure (e.g., 1, 6, 12, 20-22, 24, 27, 34, 39-41, 51-52, 64, 67-68, 72, 77, 79, 89, 94, 97-99, 134-135, 141-142); written emotional expression (e.g., 1, 25, 35, 46, 64, 75, 123, 132); emotional writing (e.g., 2, 11, 73, 75, 127, 135); written disclosure (e.g., 17, 24, 80, 119); essays about trauma (e.g., 32); expressive disclosure (e.g., 39); emotional self-disclosure (e.g., 121); disclosive writing (e.g., 47); focused expressive writing (e.g., 81); emotionally expressive and narrative writing (131); structured writing (e.g., 91, 133); developmental creative writing (125); emotionally disclosive writing (e.g., 4); expressive emotional writing (e.g., 7); focused emotional expression via writing (e.g., 7); therapeutic writing (120); self-disclosure (124) and reflective writing (e.g., 14). Some researchers use different terms for the writing intervention within the same published article (e.g., 1, 7, 21-22, 24, 40, 64, 75, 97, 132, 135). Smythe and Pennebaker (83) helped to make the distinction between emotional expression and emotional disclosure. They defined emotional expression as a natural venting of feelings, often in nonverbal ways, including crying, laughter, and screams of rage, while emotional disclosure involves a purposeful expression of emotions involving cognitive components of self-reflection and language processing. In this paper I use the term *written emotional disclosure* as defined by Smythe and Pennebaker (83) to refer to the various writing tasks used by current and past researchers related to the phenomenon of emotional disclosure through writing.

Content Analysis

Content analysis facilitates the production of core constructs from textual data through a systematic method of reduction and examination (66). Text is coded into established categories and then the number of times a similar piece of text is attributed to a particular category is counted (66). The term *content analysis* is most often used in WED studies to refer to the number and frequency of disclosure topics chosen by the participants.

Linguistic Inquiry Word Count

Pennebaker and colleagues created a computer program called the Linguistic Inquiry Word Count (LIWC) designed to analyze the linguistic content of written narratives (61, 72, 114). The most recent version, the LIWC2007, relies on a dictionary of more than 4,500 words and word stems (114). LIWC2007 captures over 86% of all words used in most writing and speech samples and can score words and word stems into multiple categories (114). Each of the default LIWC2007 categories is composed of a list of dictionary words that define that scale. The categories are: linguistic processes (e.g., word count, use of articles, use of pronouns, use of verb tenses); psychological processes (e.g. social, affective and cognitive processes); personal concerns (e.g. work, achievement, leisure, home, money, religion, death); and spoken categories (e.g. assent, nonfluencies, fillers) (114).

Global Rating System for Essays about Trauma

The Global Ratings of Essays about Trauma (GREAT) code is modeled after rubrics used to assess the writing skills of students in second through twelfth grades and is drawn from several educational rubrics, edited and combined to be relevant to a variety of narrative essays written by adults (32). Organization is coded using sub-rubrics for coherence and cohesion. The coherence score assesses the degree to which an essay has an overall plan or structure, including a related beginning, middle, and conclusion. The cohesion score assesses the degree to which sentences, paragraphs, and ideas transition easily and progressively. These two sub-rubrics are combined and averaged to create an overall organization score (32).

Narrative Analysis

There are no definitive definitions of *story* or *narrative*, and the terms are frequently used interchangeably (50, 69, 70, 137). Most scholars treat narratives as discrete units that follow a thematic, consequential or chronological sequencing, with clear beginnings and endings, and as detachable from the surrounding discourse (69). Polkinghorne (65) defines narrative as “a meaning structure that organizes events and human actions into a whole, thereby attributing significance to individual actions and events according to their effect on the whole” (p. 18). Among some scholars the definition of narrative is so overly broad to include just about anything from personal narratives and family stories to suicide notes, graffiti, literary nonfiction, and life histories (54). Riley & Hawe (70) argue that *story* and *narrative* are analytically different. The difference relates to where the primary data end and where the analysis of those data begins. According to

these researchers, people tell stories but narratives come from the analysis of stories. Therefore, the researcher's role is to interpret the stories in order to analyze the underlying narrative that the storytellers may not be able to give voice to themselves. Messias and DeJoseph (50) define stories and narratives as "interpretations of experience, reinterpreted with each telling-hearing-reading" (p. 44), and not necessarily an accurate account of what happened. They insist that reality can be shaped by environmental and contextual factors that affect participants and researchers. According to Messias (49), narratives are fluid, laced with social discourses and power relations that do not remain constant over time, and may not be consistent from one setting to the next. In each encounter with a story, narrative is reinterpreted through the evolving lens of life experience (49). The word *narrative* is used extensively in health research and it commonly refers to illness narratives, such as accounts of cancer from the patient's perspective (70).

In this dissertation, I utilize the broad definitions of the terms *story*, *narrative* and even *essay* (since I examine written narratives) and use the terms interchangeably to refer to the writings of participants in the control and intervention groups of a previous WED research study. I analyze written essays to determine if the writings are "discrete units that follow a thematic, consequential or chronological sequencing, with clear beginnings and endings" (69) recognizing that some of the writings will not meet the criteria.

There is no single method of narrative analysis but a spectrum of approaches to texts that take narrative form (69). For example, Patton (54) focuses on the hermeneutical aspects of narrative analysis stating that the foundational questions of the methodology deal with what the narrative or story reveals about the person and world from which it

came and how this narrative can be interpreted so that it provides an understanding of and illuminates the life and culture that created it. While admitting the role of interpretation, Riessman (69) broadens the definition of narrative analysis to state that the object of investigation is the story itself. The purpose of the methodological approach is to see how persons impose order on the flow of experience to make sense of events in their lives. The informant's story is examined and analyzed to determine how it is put together, what linguistic and cultural resources it uses, and how it persuades a listener of its authenticity. Narrative analysis studies the forms of telling about experience, not simply the content to which language refers (69). As a result of this diversity in the methodology of narrative analysis, the process of interpreting narratives or stories is now a point of scholarly investigation in itself (66, 69, 70).

The difference in practical approaches to narrative analysis is too vast a subject for this paper. However, to avoid the tendency to read a narrative simply for content, Riessman (69) suggests beginning with the structure of the narrative: How is it organized? Why does the participant develop the story this way? Riessman (69) encourages the researcher to start from the inside, from the meanings encoded in the form of the narrative, and expand outward, identifying, for example, underlying propositions that make the narrative sensible, including what is taken for granted by speaker and listener. In interpreting the narratives, it is important to remember that they are situated in particular interactions but also in social, cultural, and institutional discourses (69). Ultimately, the features of the narrative account an investigator chooses to write about are linked to the evolving research question and the theoretical/epistemological positions the investigator values (69).

A single theoretical process may not account for the effects of WED (28, 57, 84), however the theories mentioned to date have an underlying premise--the formation of a story or narrative (28, 61, 100, 137). My research examines the organizational formation of narratives written by participants in a previous WED research study. Therefore, in this dissertation, I use the term, *narrative analysis*, in a narrow context—that is, the examination of the coherence, cohesiveness and organization of narratives using the GREAT coding system.

Significance of the Issues and the Study

In building a program of research it is important to show that the research studies contribute to knowledge and theory in the particular discipline or applied field, and that the findings will be significant for policy and practice (46). The significance and benefits of written emotional disclosure to society, healthcare and nursing is discussed in this section.

Significance to Society

Writing is one of the defining characteristics of the human species and initially was used as a means of recording information (126). Increasingly it has been used for communication and meaning making (126). Archaeologists have found written marks in stone that go back thousands of years (126). Historically, through the sharing of oral and written accounts of their lives, individuals and communities began to identify themselves (126). Writing has long been viewed as a beneficial form of self-expression, whether it is to tell a story or chronicle life events, such as keeping a journal (131). Largely due to the

growth of the Internet, the current interest in writing has become a cultural phenomenon providing a further incentive to writing (126).

Story-telling is universal, used throughout life by persons of diverse social backgrounds in various settings, and one of the first forms of discourse we learn as children (69, 136, 137). A primary way individuals make sense of experience is by casting it in narrative form (65, 69, 136, 137). This is especially true of difficult life transitions and trauma (69). Story-making is thought to contribute to good health, not only in times of trauma, but also throughout the life span (28).

Over the past 20 years, evidence has increased to support the view that a person's emotional and attitudinal states affect physical health (95). The inhibition or avoidance of negative emotions and the suppression of thoughts lead to heightened physiological arousal, negative mood, and impaired cognition (68). Many believe that disclosure of these emotions allows people to free their minds of unwanted thoughts, to make sense of upsetting events, to regulate their emotions better, and to habituate themselves to negative emotions (20). This process, in turn, improves social connections and leads to health benefits (20).

WED studies demonstrate the power of translating emotional experiences into language. Writing about emotional topics can affect peoples' lives and health, and many people find the writing paradigm beneficial regardless of the instructions or underlying theory driving the study (56).

Significance to Healthcare

As mentioned previously, over the past 20 years, evidence has increased to support the theory that a person's emotional and attitudinal states affect physical health (95). Recently, the medical community has experienced a growing awareness of the interrelatedness of biological, behavioral, and psychological factors on health outcomes (95). This awareness, coupled with the rising costs of health care, has fostered the need for cost-effective and readily accessible interventions.

Some of the striking benefits of WED found in the early research include improvements in immune functioning, reduction in clinic visits, decreased self-reported upper respiratory problems (20), decreased psychological distress, and improved coping and adaptive behaviors (95). Later studies found correlations between WED and reductions in pain-related behaviors and medication use among chronic pain sufferers, reduced depression rates among victims of crime, improved health and adjustment among post-partum women, and decreased illness behavior among psychiatric prison inmates (95). Results of recent studies suggest that the use of WED may reduce post traumatic stress disorder (PTSD) symptoms among female caregivers (20); has sleep-related benefits in terminally ill cancer patients (16); provides an increase in working memory capacity (31); enhances wound healing (98); and provides health benefits in persons with fibromyalgia (24, 27), breast cancer (39, 89, 143), HIV/AIDS (52, 64), asthma (97), and low risk surgical patients (86). In addition, some studies suggest that WED done at home (24) and over the internet (75-76) can produce positive health and social outcomes.

Psychoanalysis and cognitive-behavioral therapies have provided settings in which individuals could safely verbalize their emotions surrounding traumatic and

stressful events (95). However, for those individuals who fear negative social consequences (95), or for those who cannot afford a therapist, WED has the potential to become a readily available, low-cost self-help intervention that can improve or enhance physical, mental, and emotional health (81).

Relevant to the significance of the WED paradigm and the importance of narrative to healthcare, it should be noted that programs in narrative medicine are being developed in which students learn how better to "read" their patients' stories through literary studies (10). Dr. Rita Charon, the director of the narrative medicine program at Columbia University, describes her working definition of narrative as words, gestures, silences, tracings, images and physical findings cohered into stories that make enough sense to be acted on (10). She realizes that what patients pay her to do is to listen very expertly and attentively to their complicated narratives (10). She describes her realization about the importance of narrative as follows:

Medicine is deeply saturated with narrative practices, not only in creating therapeutic alliances with patients and instilling reflection in our practices but also generating hypotheses in our science, learning our fabulous tradition of explanations about the human body, teaching students and colleagues what we know about sickness, acting with so-called professionalism toward one another and our patients, and entering into serious discourse with the public about what kind of medicine our culture wants. I invented the term "Narrative Medicine" to connote a medicine practiced with narrative competence and marked with an understanding of these highly complex narrative situations among doctors, patients, colleagues, and the public (¶7).

According to Dr. Charon (10), narrative medicine proposes "an ideal of medical care-- attentive, attuned, reflective, altruistic, loyal, able to witness others' suffering and honor their narratives -- that can inspire us all to better medicine, it also donates the methods by which to grow toward those ideals" (¶10).

Dr. Charon (10) believes that any medical professional can improve his or her capacity for empathy, reflection, and professionalism through narrative training. More and more medical schools and medical centers are adopting narrative methods of study (10, 124). Dr. Charon states:

Ultimately, narrative medicine may offer promise as a means to bridge the current divides between doctors and patients, between doctors and doctors, between doctors and themselves, illuminating the common journeys upon which we all are embarked (10, ¶10).

Narrative medicine offers a model for improving communication between patients and physicians, quality of care, and health outcomes (135). Narrative medicine aims to empower patients, giving them a sense of control during a time when patients often have lost control, and it balances the practice of medicine, making it more humane and less technologically focused (135). According to Cepeda (135) and colleagues, “narrative medicine facilitates the creation of therapeutic alliances with patients and the selection of treatments that make sense within the story lived by patients and their families” (p. 624). Research suggests that the interaction between the patient and doctor plays an important role in the use of health resources by the patient, and that patient participation in health care decisions reduces health care costs (135).

According to one recent study, journal writing was found to be a useful tool in consolidating knowledge and was used along with traditional exercises for learning psychiatry such as writing chart notes, process notes, and completing required studies for examinations (124). Many family practice training programs are using journal writing to enhance resident reflection in a formal way, almost like process notes for nonpsychiatrists (124). Encouraging residents to learn from, rather than suppress, their emotions is a method of teaching both compassion and objectivity, because the ability to

read one's own feelings is considered a first step to setting the feelings aside and become a more astute, neutral reader of the patient's feelings and needs (124).

Dr. Charon invented the "Parallel Chart" (139 ¶1) to encourage her medical students to reflect, consider, and think about what they were going through as they attended to their patients. She told her students to write in the Parallel Chart what they could not write in the hospital chart. According to Dr. Charon, "only when you write do you know what you think....there is no way to know what you think, or even what you experience, without letting your thoughts achieve the status of language. And writing is better than talking" (139 ¶1). She believes that if doctors are not prepared for profound emotional experiences, the natural recourse is to detach and "hide behind the various barriers that we all hide behind, of objectivity, and 'I only have six minutes for each patient,' and all of that" (139 ¶1). According to Dr. Charon, attending to the interior life of our developing doctors will produce doctors who do not flinch when things don't go well and who do not "abandon patients when they're dying" (139 ¶1).

Although Pennebaker's WED paradigm currently focuses primarily on how narrative interventions affect the storyteller, one can envision the potential effects of this intervention on its audience. Written emotional disclosure could become a tool to achieve some of the goals of narrative medicine as described by Dr. Charon --to develop therapeutic alliances between health care professionals and patients; to instill reflection, attentiveness, altruism and empathy in health care practitioners; to increase the use of health resources by the patient; and to reduce health care costs.

Significance to the Science/Discipline of Nursing

Basic nursing research is undertaken to accumulate information or to formulate or refine a theory (108). Applied nursing research is focused on finding a solution to an immediate problem (108). Nursing needs basic research to discover general principles of human behavior and biophysiological processes, but applied research informs nurses how these principles can be put to use to solve problems in the practice of nursing (108). In nursing, the feedback process between basic and applied research operates freely. The findings from applied research usually pose questions for basic research, and the results of basic research often suggest clinical applications to practical problems (108). My dissertation is a good example of this feedback process between basic and applied research. My research is *basic* in that I attempted to determine if writing an organized essay would result in positive mental and physical health outcomes, which is considered an accumulation of information to refine a theory. My research is *applied* in that the previous study I utilized in my dissertation research used the WED intervention in actual populations with health concerns (i.e., persons with breast cancer treatment-related lymphedema) to hopefully positively affect health outcomes. If I determine that there is a correlation between organizational scores of essays and positive health outcomes, then future research can apply this basic knowledge, for example, in possibly informing their instructions for writing—again, hopefully, resulting in better clinical outcomes for the participants.

The discipline of nursing is more than theory and research however. The discipline of nursing encompasses all that nursing is and all that nurses do and often overlaps with other disciplines (102). The discipline of nursing requires knowledge and

methods other than nursing science, but nursing science is the essence of nursing as a scholarly discipline (102). Nurse scientists continue to discuss the ultimate meaning of the patient's experiences of health and healing (103). The patient as environment was first conceptualized by several nurse theorists (e.g., Levine, Orem, Paterson and Zderad, and Neuman) who wrote about the internal environment of the person as an innate resource for health and development (103). The significance of an inner healing environment is supported by current world-views about human potential and transformative capacity (103). Research on the phenomenon of WED is relevant to nursing science and practice because this research contributes to nursing's metanarrative—that the natural source of healing resides in the patient (103). The use of this intervention has the potential to empower human beings' natural abilities for health and healing and to improve patient outcomes.

Research on emotion regulation has shown that suppression of emotion increases sympathetic activation that may result in adverse physical and psychological outcomes (78). If disinhibition of emotion is the mechanism of change associated with WED (78), disclosure of previously inhibited feelings can lead to stress reduction, improved immune functioning, and better health (78). If, as suggested by some researchers (78), writing about a traumatic experience allows a person to provide structure, organization, and cohesion to traumatic memories, WED can promote insight and cognitive assimilation of traumatic memories, free working memory, and increase one's ability to engage in more appropriate coping behaviors in the wake of exposure to stressful events (100). And if the health benefits of WED are related to the processing of emotion (78), writing can reduce fear by activating the fear structure through exposure and providing corrective

information about the stimuli, responses, and their meanings (78). With continued nursing research as supportive evidence for positive health outcomes when utilizing WED, nurses can feel confident in bringing the technique to the bedside for use with their patients.

The utilization of WED as a nursing intervention reflects a holistic perspective and philosophical approach to care that encourages the empowerment of the patient's natural potential for health and healing through learned coping skills and strategies that can be used independently. This approach implies respect for patients' ability to grow and improve, and in their ability to care for themselves.

Gaps in Our Knowledge of the Significance of Written Emotional Disclosure

WED has the potential to be a cost-effective, time-efficient, therapeutic intervention that could possibly be used as a self-help intervention, nursing intervention and/or a preventive measure. However, the underlying mechanisms of the WED paradigm are not well understood. Attention toward understanding these mechanisms, as well as the types of persons who would benefit from the use of written emotional disclosure, is currently needed (30). Only after this knowledge has been attained can the full significance of written emotional disclosure be appreciated.

Theoretical Frameworks

Scientists engaged in WED research cite numerous theories. However, due to the constraints of this paper only the most frequently cited theories, *emotion inhibition*, *cognitive adaptation*, and *exposure/emotional processing*, along with additional theories deemed pertinent to this research project, *working memory* and *creating a coherent*

narrative, are outlined briefly here and discussed and assessed when synthesizing the current research.

Emotion Inhibition

Pennebaker's original research was based on inhibition theory (95). Research on emotion regulation has shown that suppression of emotion increases sympathetic activation that may result in adverse physical and psychological outcomes (78). Pennebaker proposed that the disinhibition of emotion was the mechanism of change associated with WED (78). He suggests that disclosure of previously inhibited feelings leads to stress reduction which consequently leads to improved immune functioning and health (78).

Cognitive Adaptation

More than one theory of cognitive adaptation to traumatic or stressful experiences exists, but they all share the concept that the processing of the experience requires changing existing schemas (78). When research participants are asked to explain why they think WED is beneficial, the majority state that the writing is helpful because it allows them to gain insight into what has happened to them or is happening to them (20). Researchers suggest that individuals frequently hold three core assumptions: they are invulnerable, the world is meaningful and comprehensible, and they view themselves in a positive light (78). Additional assumptions inherent in these core assumptions include that people are trustworthy, moral, and compassionate, and that misfortunes are infrequent. These assumptions are disrupted by trauma, and individuals who experience the traumatic

or stressful event must come to terms with these shattered assumptions (78). That process involves a reestablishment of a conceptual system in which either the experience is assimilated into the old set of assumptions or the core assumptions are changed to accommodate the trauma (78). Pennebaker (cited in 78), among several other researchers, suggested that writing about a traumatic experience may allow a person to provide structure, organization, and cohesion to the traumatic memory, which may not have been developed initially, promoting insight and cognitive assimilation of the traumatic memories.

Exposure/Emotional Processing

The exposure theory, also referred to as the habituation model (39, 95), argues that repeated confrontation, description, and reliving of the thoughts and feelings of the traumatic experience lead to extinction of those thoughts and feelings (20) by promoting psychological or physiological habituation (95). More recently researchers combined this learning theory with cognitive theories of responses to stressful experiences and termed this combination *emotional processing theory* (78). This theory draws from the bioinformational theory of emotion in which pathological fear is a cognitive structure that includes erroneous information about stimuli, responses, and their meanings (78). Exposure techniques reduce fear by activating the fear structure through exposure and providing corrective information about the stimuli, responses, and their meanings (78). Written emotional disclosure may allow an individual to be repeatedly exposed to aversive stimuli, allowing for extinction, or the exposure may activate fear structures and

provide corrective information to an individual about the stimuli, responses, and meanings (78).

Working Memory

Working Memory (WM) is a key cognitive function used in daily life that allows individuals to hold information in mind for brief periods of time (107). WM is described as a passive store component plus attentional control (107) responsible for the controlled processing and attention needed for higher order processes such as comprehension, reasoning, planning, and problem solving (31). Working Memory capacity refers to the capacity for controlled, sustained attention in the face of interference or distraction, and this controlled attention determines the content of consciousness (100). Controlled attention is required to keep goal-relevant information active and to inhibit extraneous goal-irrelevant information that includes intentional and unintentional thoughts about personal experiences (100). In other words, WM is one of the most crucial cognitive capabilities, essential for countless daily tasks like following directions, remembering information momentarily, complex reasoning, or staying focused on a project (107). Cognitions about ongoing or unresolved stressful events are among the irrelevant demands that compete for WM resources (100).

The relationship of WM to problem solving and fluid intelligence suggests that WM could affect health (100). People who are using WM capacity to avoid stressful thoughts have less attention available for solving problems posed by stressful life events and may respond less effectively to threat and loss (100). The WM and problem-solving deficits experienced by highly stressed people could be one factor that contributes to the

perpetuation of their high levels of stress (100). Given that stress has direct effects on immune function and illness development and progress, people with impaired WM capacity who experience higher levels of stress may subsequently experience poorer health (100).

The WM improvements produced by expressive writing might increase a person's ability to focus attention on the problem solving, planning, and proactive coping necessary to mitigate or avoid many stressful events (100). There is evidence that higher cortisol levels are associated with more intrusive thinking (100). Because stress-level cortisol elevations are linked to immune system responses, writing-produced reductions in intrusive thoughts could have a positive impact on immune function and subsequent health (100). A broadened understanding of WM and its relationship to problem solving, stress, and immune functioning might positively influence the treatment of persons suffering from WM deficits (e.g., children and adults with attention problems, people with learning disabilities, stroke victims) (107).

Creating a Coherent Narrative

Another theory gaining support in the WED paradigm is the theory that disclosure forces individuals to place a cognitive structure on their experiences. When those ideas are communicated through language, individuals attempt to deliver a coherent message, and therefore structure the content to make it understandable to themselves and others (42-43, 61, 63, 100-101, 137). The construction process emerges over time with repeated writing or telling, often moving from a vague and disorganized account of the experience to a coherent, cohesive, and insightful explanation of events and feelings (61). This process

allows for a cognitive reorganization or integration of thoughts and feelings related to the experience (42-43, 61). The linguistic representation of a trauma thus may enable an individual to have greater perspective on the experience, potentially changing or expanding its meaning. The act of labeling emotions has been associated with reduction in perceived intensity. Therefore it is plausible that labeling emotions through WED allows individuals to reduce the perceived affective intensity of stressful events while simultaneously affording them an increased sense of control over affective experience through the act of linguistic representation (42-43, 61,100-101). The degree to which individuals form narrative structure in WED may predict health improvements (85).

Booth and Petrie (101) go a step further by suggesting that the molecular and cellular contexts of immune recognition be construed as the “emotions” of the immune system—modulating and moderating the cognitive and perceptual behavior of the immune network (101). The biological pathways of WED might act then through coherence between psychosocial and neuroimmune “emotional” changes (101). For example, a traumatic event not adequately assimilated by an individual may condition the cognitive, perceptual, and emotional flow of life such that the neuroimmune network provides a context in which innocuous antigens are more likely recognized inappropriately (101). Following a change in the psychosocial context of the traumatic event as a result of WED, we might expect to see changes in the way antigens are recognized by the immune system such that previously inappropriate or damaging patterns of immune response become more appropriate and health-promoting (101).

CHAPTER II

LITERATURE REVIEW

Following an examination of written emotional disclosure literature published in the past 12 years, this chapter includes a synthesis of conceptual/theoretical knowledge and methodological approaches used in this research. This synthesis includes some of the findings from Frattaroli's (20) meta-analysis of 146 WED studies. In this literature review, there is a particular emphasis on how researchers are analyzing the narratives of the studies' participants.

Synthesis of Conceptual/Theoretical Knowledge

A majority of the empirical studies and the theoretical literature involving the WED paradigm cite the work of Pennebaker and state that they are using and building upon that body of knowledge. The most common theoretical models continue to be emotion inhibition (emotional release, experiential avoidance) (3, 6, 15, 20-21, 53, 61, 68, 78-79, 85, 93); cognitive adaptation (cognitive reappraisal, cognitive processing, cognitive emotional processing, affective change) (6, 20, 24, 26, 28, 31, 42, 53, 64, 78-79, 85, 94, 96); exposure/emotional processing (habituation) (6, 24, 32, 42, 72, 77-79, 85) and narrative theory (creating a coherent story) (1, 28, 31-32, 42-43, 61, 74, 85, 100-101). In addition, researchers less frequently mentioned self-regulation theory (4, 20, 28, 44, 72); the social integration model (20, 28, 79); working memory theory (3, 28, 31, 100); the experiential model of disclosure (43); Pennebaker's inhibition confrontation theory (48); Pennebaker's self-disclosure health model (92); Horowitz's intrusion/avoidance theory (42); and theories of coping (19) and attachment (92).

Even with the numerous theories and models cited in WED research, the linkage with Pennebaker provides some coherency to the literature on this phenomenon. Many researchers in the field, including Pennebaker (56), now suspect that there is probably no single theoretical process that explains the findings of WED research, but rather that multiple interacting factors are driving the effectiveness of this writing intervention (43, 56-57, 84). Pennebaker (56) reiterates this stance in the following statement:

To me, the essence of the writing technique is that it forces people to stop what they are doing and briefly reflect on their lives. It is one of the few times that people are given permission to see where they have been and where they are going without having to please anyone. They are able to prioritize their goals, find meaning in their past and future, and think about who they are at this point in life. Unfortunately, this “essence” is inherently vague. It encompasses theoretical stances associated with self-regulation, search for meaning, creation of coherent stories about one’s life, habituation, emotional awareness and expression, as well as more molecular and molar processes (p. 283).

Pennebaker’s statement itself reflects the notable progression of thought throughout the years of WED research that leads to his assessment.

Pennebaker’s original research was based on inhibition theory (95). However, research demonstrates that this explanation of the effects of WED might not be sufficient (20, 95). One study found that participants who were low in dispositional constraint benefited most from WED—contrary to what would be expected if disinhibition of emotion is the mechanism of change (20). In addition, researchers are obtaining mixed results about the need for the writing topic to be previously undisclosed or something that occurred in the past (20, 95).

Researchers have also emphasized the role of change in cognition as being an essential process of WED (72). When individuals are better able to regulate their emotions through writing, they have more cognitive resources that enable them to process the

trauma, formulate a less threatening narrative, and find meaning in the event (72). Such actions should reduce stressful and intrusive emotions and thoughts and related physiological arousal, which, if left unregulated, would be expected to lead to somatic symptoms, compromised immune functioning and psychological problems (72).

The first study to examine the moderating effects of cognitive adaptability on outcomes of WED was conducted by Wagner and colleagues (96) in their research exploring effects of WED on psychological well-being and perceived health status among persons with HIV. They found that participants who reported lower levels of cognitive adaptability prior to writing about stressful or traumatic events showed the most decline in positive affect, HIV-related quality of life, HIV-specific physical functioning, and HIV-specific optimism one month after completion of the writing task when compared to participants assigned to the WED condition who had higher levels of cognitive adaptability. Their data also suggested that people high in cognitive adaptability might be harmed somewhat by being asked to write about trivial topics.

In Frattaroli's (20) meta-analysis of 146 WED studies, exposure therapy received the most support. Posttraumatic stress disorder (PTSD) symptoms were marginally reduced by WED, and studies that used participants with a history of trauma had higher effect sizes for subjective impact outcomes (20). Although there is debate in the literature regarding the nature of traumatic memories, it is relatively well documented that exposure therapy, through repeated imaginal exposure or retelling of a coherent and integrated narrative about the targeted traumatic event, is an effective treatment for trauma symptoms (32).

The theory regarding working memory (WM) suggests that memory is never an exact reproduction of experience (100). Memories have the potential to bring back the emotions of an experience, and if these emotions are intense enough, they may disrupt other cognitive processes (100). Initially, memory reconstructions of stressful experiences are fragmented (100). Because of their weak organization, activation of these stressful memories requires little attention even though attempts to suppress them require effortful processing (100). When the self-memory system cannot suppress these highly accessible memories, they come into consciousness as unwanted and involuntary thoughts (100). These stressful memories compete for limited attentional resources through either intrusion or suppression mechanisms (100).

I agree with Pennebaker and the other researchers who conclude that a single theoretical process may not account for the effects of WED (28, 57, 84). Several of these researchers conclude that the theories mentioned to date have an underlying premise--the formation of a story or narrative (28, 61, 100, 137). My research deals with examining the formation of this narrative and the importance of coherence and cohesiveness to the narrative. According to Pennebaker, linguistically labeling an event and its emotions forces the experience to be structured and so promotes the assimilation and understanding of the event and reduces the associated emotional arousal. In other words, translating traumas and their accompanying images and emotions into language, or creating a narrative, loosens their claim on scarce attentional resources and allows the experience to be encoded and stored in a more organized, coherent, and simplified manner, thus enabling the person to move on with life (28, 57, 60-61, 100).

Because of the potential importance of emotion regulation processes like reappraisal to psychological and physical health, there is recent motivation to better understand the brain and body correlates of this ability. Most emotion researchers recognize that emotional responses involve changes not only in the brain, but also in autonomic physiology (138). Urry (138) and colleagues investigated the premise that individual differences in autonomic physiology could be used to specify the nature and consequences of information processing taking place in medial prefrontal regions during cognitive reappraisal of unpleasant pictures. These researchers found that voluntarily regulating responses to affect-laden visual stimuli using reappraisal relies in part on medial prefrontal brain regions and has consequences for autonomic physiology (138).

Being able to compose a story about a stressful experience reduces the size and complexity of the original experience into a smaller unit that lets memory work less hard and provides a constancy of lessons to be learned which does not need to be constantly reexamined (100). In the course of creating a coherent narrative, memories of the negative events become embedded in the story, weakening the accessibility of these bad experiences and lessening the likelihood that internal or external stimuli will activate them (100). To the extent that production of a coherent narrative about a stressful experience frees WM resources for more effective coping, the increased availability of these resources can be marshaled to help cope with life stressors that otherwise manifest themselves in various health problems (28, 31, 100).

Several researchers concluded that expression alone is not very beneficial, and that rumination can be harmful (28, 36, 43, 92). Two research studies (59, 62) provided supportive indirect evidence that persons whose linguistic categories showed the least

amount of change, suggesting rumination, across the days of writing benefited least. Therefore, some researchers (23, 28, 36, 43, 71, 73, 92) suggest that bringing about a change in the type of disclosure is necessary along with the restructuring and reorganizing of complex emotional experiences (e.g., greater use of positive emotion words, moderate use of negative emotion words, and increased use of cognitive processing words). An example of how change could be accomplished is provided in a study conducted by Gidron (23) and colleagues. These researchers provided guided written disclosure instructions in which participants were asked to describe a traumatic event chronologically, reflect on their thoughts and feelings at the time of the event and how it affected their lives, and then describe their current perspective on the event. The participants experienced reduced symptoms and fewer clinic visits as compared to participants in the control group (23). Therefore, the healthy writer is conceptualized as telling an evolving organized story using emotion while recognizing the negative, but emphasizing the positive (28). Writing that is fragmented may not only fail to improve health, but may be harmful (28). In addition, writers who show a progressive shift in their use of first person singular pronouns to third person singular pronouns are seen as being better off than those who continue to use first person singular pronouns (28, 73), which also supports the theory that the *formation* of a coherent narrative is desirable for beneficial results.

Methodological Approaches

Although most researchers acknowledged the work of James W. Pennebaker and state a desire to build upon his work, specific methodologies and populations differ.

Studies vary in several ways: their conceptual/theoretical frameworks; research questions and outcome variables; instruments and data analysis techniques; writing instructions, topics, dosages and approaches; the timing of the sessions; the places where the writing took place; and the length of study.

To highlight the methodological differences found in the WED literature, it is worth briefly mentioning the methodological synthesis done by Frattaroli (20) in her meta-analysis of 146 studies involving WED. The average number of participants in the studies was 78. The typical study had four 20-minute disclosure sessions; 53% were scheduled on consecutive days. Participants wrote about negative topics that occurred on an average of 16 months before disclosure in 86% of the studies, and 35% of the studies specifically instructed participants to discuss an undisclosed topic. In 4% of the studies participants were given instructions designed to promote cognitive processing or insight; 52% of the studies instructed participants to disclose a past event; 50% of the studies gave participants directed questions or examples of what to disclose; and 48% did not give participants any instructions about topic switching. Participants turned in their disclosure in 92% of the studies, and 77% of the studies had participants provide handwritten disclosures (vs. typing, talking).

In addition to reporting in detail her findings on the six outcome types she identified (psychological health, physiological functioning, reported health, health behaviors, subjective impact of intervention, general functioning/life outcomes), Frattaroli (20) looked at four methodological variables related to the general conduct of the study as potential moderators of the effect of WED: number of participants; whether participants were paid; predisclosure priming; and the timing of follow-up. The number

of participants was not significantly related to the overall, reported health, or subjective impact effect size. However, the number of participants was marginally related to psychological health effect size in that studies with more participants had smaller effect sizes ($r = -.181$). Studies in which participants were paid had significantly higher subjective impact effect sizes (paid, $r = .167$; unpaid, $r = -.006$). Predisclosure priming did not act as a significant moderator for any of the effect size types. The timing of the follow-up moderated the effect of WED for the overall effect size (less than 1 month, $r = .111$; at least 1 month, $r = .064$) and psychological health effect sizes (less than 1 month, $r = .110$; at least 1 month, $r = .035$).

Fratraroli (20) looked at 12 treatment variables as potential moderators of the effect of WED: dose-related variables (number of disclosure sessions, length of disclosure sessions, spacing of disclosure sessions); topic related variables (valence of disclosure topic, months since trauma or topic, prior disclosure of topic); instruction-related variables (focus of disclosure instructions, time reference of disclosure instructions, presence or absence of directed questions or specific example of what to disclose, and instructions regarding topic switching); audience of disclosure; and mode of disclosure (handwriting, typing, or talking). Studies with three or more sessions had marginally larger effect sizes than studies with fewer than three sessions for overall effect (fewer than three sessions, $r = .040$; at least three sessions, $r = .082$), psychological health effect (fewer than three sessions, $r = .007$; at least three sessions, $r = .063$), and subjective impact effect (fewer than three sessions, $r = .019$; at least three sessions, $r = .173$). Studies with sessions that lasted at least 15 minutes had significantly larger effect sizes than studies with shorter sessions for overall effect (less than 15 minutes, $r = -.007$; at

least 15 minutes, $r = .080$) and reported health effect (less than 15 minutes, $r = -.132$; at least 15 min, $r = .078$). The spacing of sessions was not found to be a significant moderator for any of the effect size types.

Valence of the writing topic was not found to be a moderator. Months since the upsetting event or topic significantly moderated the effect of disclosure for the overall effect size ($r = -.283$), psychological health effect size ($r = -.323$), and reported health effect size ($r = -.289$), such that studies in which participants wrote about more recent traumas or topics had larger effect sizes. Prior disclosure of the topic was not found to be a significant moderator for the overall effect size, reported health effect size, or subjective impact effect size. However, studies where participants were told to discuss previously undisclosed topics had marginally larger psychological health effect sizes (undisclosed, $r = .092$) than studies in which participants were not given this instruction (no instruction, $r = .042$). The presence or absence of directed questions or examples in the disclosure instructions moderated the effect of WED for the overall effect size (directed questions, $r = .090$; no directed questions, $r = .052$) and for the psychological health effect size (directed questions, $r = .094$; no directed questions, $r = .011$). Studies in which participants did not turn in their disclosure had marginally higher psychological health effect sizes than those studies in which the participants turned in their disclosure (did not turn in, $r = .178$; turned in, $r = .050$). The mode of disclosure (e.g., handwriting, typing, talking) did not significantly moderate the effect for any outcome types.

Synthesis of Methodological Knowledge Pertaining to Text Analysis

Pennebaker (56) admits that during the first few years of the writing research, it did not occur to researchers to explore how people wrote about traumatic experiences. During the past decade, however, it has become increasingly clear that some ways of writing are more likely to yield health improvements than others (56). Various methodological approaches used to analyze the written essays produced by the participants in WED studies conducted within the past twelve years are examined in this dissertation. I reviewed 108 published research articles to determine what, if any, narrative analysis was done by the researchers. The majority of these selected articles were randomized, controlled, intervention studies, the methodological approach still considered the “gold standard” in intervention research. There was no mention of any text analysis in 23 of the reviewed articles. Twenty-nine studies utilized the LIWC to analyze the texts of the participants’ essays and 23 articles summarized the content of the essays. Five articles mentioned that independent raters read the essays and classified the essays into the correct condition (e.g., intervention or control group) (4, 51, 53, 72, 89) and four WED studies included a qualitative analysis of the essays (37, 71, 86, 133).

Content Analysis

The most cursory analysis of WED essays was in the form of a content analysis. Many researchers ascertained and listed the common themes of the essays (6, 8, 17, 24, 31, 33, 35, 37, 41-42, 48, 51, 53, 64, 68, 72, 77, 79, 96, 121, 131, 133). The most common themes included the illness, injury, or death of a family member or friend; personal health issues; physical or

mental abuse; adjustment issues; family conflicts; secrets; and miscellaneous traumas.

The listing of themes in these research articles was provided without discussion of what this information might contribute to the body of knowledge regarding the effects of the writing paradigm on health outcomes.

LIWC

The most commonly mentioned method of text analysis by these researchers was the use of the Linguistic Inquiry Word Count (LIWC) software program. To facilitate an understanding of what processes facilitate change through writing, Pennebaker and colleagues created this program to analyze the linguistic content of written narratives (60, 61, 114). The studies utilizing the LIWC and reviewed for this paper compared word usage between the writing intervention groups and the control groups by examining the following: word count (9, 13, 24, 97); emotion word usage (9, 11, 13, 16, 63, 72, 76, 123); positive word usage (9, 11, 17, 45, 47, 76, 80, 94, 97); negative word usage (9, 11, 13, 17, 47, 72, 76, 80, 94, 97); the use of cognitive/insight/causality words (11, 13, 16-17, 24, 45, 47, 63, 71-72, 80, 94, 97); social processing word usage (16, 63, 71); the use of time orientation words (16, 45, 63); affect processing word usage (16, 24); the use of words relating to the body (24), identity (63), optimism (45), benefits (45), and costs (47); the use of first person pronouns (11, 45); and the use of exclusive words (13, 45). Most researchers were primarily interested in how the words participants used in the WED intervention group (as computed by the LIWC text analysis program) influenced health benefits. Several studies used the LIWC as a manipulation check to test whether the writings of the control and intervention groups differed as expected (6, 24, 71-72, 80, 87, 97, 122). Some studies using the LIWC program found that heavier use of insight-

related and causal words predicts improvement in health, as does heavier use of positive emotion words and using a moderate number (contrasted with very high or very low numbers) of negative emotion words (28, 45, 61, 71-72, 97).

A typical example of a WED study using LIWC is provided by de Moor ⁽¹⁶⁾ and colleagues. In this study, 42 patients with metastatic renal cell carcinoma participating in a Phase II clinical trial were randomly assigned to a WED or neutral writing (NW) group. Patients in the WED group wrote about their cancer, and patients in the NW group wrote about health behaviors. Linguistic analysis was conducted using LIWC software. Comparisons between the WED and the NW group showed significant differences in word usage on 24 of 32 categories, including the major categories of affect processing, cognitive processing, social processing, time, and metaphysical, suggesting that the WED exercise evoked emotional expression and cognitive and emotional processing of the cancer experience.

Another example of how the LIWC is used in WED research is provided by Mackenzie ⁽⁴⁵⁾ and colleagues. In their research they explored treatment mediators among caregivers of older adults who did not benefit from WED in a previous randomized clinical trial. They used the LIWC to analyze cause, insight, first person, exclusive, optimism, future, and positive affect words. Results most strongly supported the hypothesis that expressive writing benefited caregivers who used increasingly positive, optimistic, and future-focused language. Markers of meaningful narrative development were not predictive of improvement as they had been in previous research perhaps because caregivers were in the midst of emotional upheavals (rather than writing after the trauma). In contrast, WED participants who used increasingly frequent exclusive words

showed improvement in psychological distress, suggesting that the minority of caregivers in the WED condition who wrote about their situation with increasing honesty and complexity benefited from doing so.

Rivkin (71) and colleagues provide another example of the importance of text analysis. In studying the effects of WED on adjustment to HIV, they found no effects from the writing condition. However, WED participants who included increasing insight/causation and social words in their writing had better immune function and reported more positive changes at follow-up. While women and men seemed to respond similarly to the writing intervention, there were some gender differences in the writing samples with women including more social words.

The LIWC provides an efficient way to examine a large number of WED essays to learn whether the words people use to express themselves can predict long-term psychological and physical health (60). The LIWC also allows researchers to explore personality and social processes of individuals, groups, and even cultures in other times and places (63). However, researchers are beginning to question whether the LIWC output provides a complete picture of what makes WED beneficial. There are some identified problems with this adoption of a word usage approach to the analysis of written language (60). The LIWC program calculates the percentage of words associated with various content categories, but is unable to consider context, irony, sarcasm, or even the problem of multiple meanings of words. The program cannot capture the tone or theme of an essay and cannot assess other qualitative aspects of the narrative that have been speculated to be important for successful emotional processing such as depth of emotion, coherence, cohesion, and level of detail (2, 17, 32, 39, 60, 63).

Although the original version of the LIWC underwent extensive testing in the creation of the language categories, the categories themselves were somewhat arbitrarily created by the authors and their colleagues (60) and reflected the perceptions of English-speaking psychologists, linguists, and college-student judges in the U.S. in the early 1990s (63). Plus, the original version was designed to study the language people used when writing about traumatic experiences (60). The most recent version of the program, the LIWC2007, includes substantial updating of the dictionaries and modification in the dictionary structure. Since 1986, text samples from 72 separate WED studies in the United States, Canada, and New Zealand were collected, analyzed and compared. Other classes of text included: 113 highly technical articles published in 1997 or 2007; 714,000 internet web blogs posted in 2001; 209 novels published in English between 1700 and 2004; and seven observational studies in which participants were tape-recorded while engaging in conversations with others (114).

The LIWC is easy to use and useful for certain purposes, but it may be best used in conjunction with a method that is able to capture the more subtle, qualitative aspects of the written narratives (17), and both the context and structural dimensions, such as chronology, completeness, and overall coherence and cohesion of the narratives (19).

GREAT

According to Klest and Freyd (32), the use of causal and insight words is assumed to reflect a tendency toward constructing a coherent narrative, but, as noted previously, coherence cannot be directly assessed by the LIWC and this assumption is not supported with research. These researchers determined that a better rating system was needed to

assess to what degree the characteristics of an essay as a whole contribute to health improvements. They examined rating systems used to code the coherence and cohesion of children's fictional narratives and then developed a global rating system for essays about trauma (the acronym of which is GREAT code).

Klest and Freyd (32) collected essays for analysis that were from a larger study investigating the relationship between betrayal trauma and physical and mental health for adults with chronic pain and chronic health problems. The study results showed that organization scores (i.e., the sum of coherence and cohesion ratings) were significantly predictive of decreases in physical and mental health symptoms. Causal and insight words as measured by the LIWC were not predictive of outcomes, and did not overlap significantly with organization scores in this set of essays. The researchers concluded that the GREAT code measures a quality of essays that has predictive power and that is not captured by other coding systems currently used by researchers in this area.

One question raised by the Klest and Freyd (32) study is whether the health benefits of expressive writing seen in other studies are actually due to writing about *emotional* topics, or whether they are perhaps solely due to *formation of coherent and cohesive essays*. It is possible that asking participants to write about the most traumatic event they have ever experienced prompts more organized narratives than instructions to write about time management. If this is the case, the health benefits seen in previous studies might be accounted for simply by differences in essay organization (32). There are several limitations to this study. Essays by only 40 participants were included in the data analysis. Therefore, the power of analyses was relatively low and important relationships may have been missed. In addition, the same set of essays was used for both the code

development and the final coding although no essay was rated by the same person. And finally, participants in this study were generally low income with chronic health problems. Therefore, the findings in this study might not generalize to other populations (32).

Qualitative Methods

Three of the randomized, controlled, intervention studies reviewed included some type of qualitative analysis of the written essays (37, 71, 86). In addition, one published article reviewed was a case-study presentation of a 38-year-old woman diagnosed with PTSD who completed written emotional disclosure sessions over three consecutive days (81).

In their research, Lewis (37) and colleagues were encouraged by the beneficial effects of WED for lesbians less open about their sexual orientation, but WED did not appear to be helpful for those lesbians who are more open. The article's methodological discussion that followed was somewhat confusing. They suggested that although they did not conduct "content analysis" (p. 155) of participants' essays, this would perhaps provide some insight in future studies. But then the authors followed that statement with excerpts from various essays showing the differences between the writings of lesbians who are open about their sexual orientation and those who are not—which appeared to be a type of qualitative analysis.

Rivkin (71) and colleagues added a qualitative portion to their empirical analyses of the effects of written emotional disclosure on adjustment to HIV. Although these researchers did not name their particular qualitative method, it appeared as if they

conducted a narrative analysis of the written essays illustrating themes with salient quotations. The themes of the WED group essays were: the participants' sense of loss; the uncertainties of living with HIV; the fears of planning for the future; the positive and negative aspects of living with HIV; the experiences of finding strength over the years in living with HIV; and the experiences of questioning purpose or legacy. These researchers also examined the time management writings of the control group and discovered that in most cases, those essays could be easily distinguished from those of the WED participants. Typically, the stories control participants wrote were not as deeply personal and emotional as those of expressive writing participants. However, many participants in the control group inserted their emotions and thoughts into the writing, reflecting on how something that happened that day made them feel. In addition, the control writers were facing many ongoing challenges in their daily lives (such as adhering to complicated HIV medication regimens) that were revealed in their descriptions of their daily activities. Although the control writing did not elicit as much emotional expression or cognitive processing as the expressive writing (as indicated by the LIWC results), participants did use the exercise to discuss social aspects of their lives. Whereas many of the expressive writers explained that the intervention helped them confront and express difficult emotions, increased their insight and self-awareness, and helped them face reality, many control writing participants explained that their writing was meditative, helped them reflect on their day, and helped them recognize that people cared about them. The researchers concluded that even control participants may have benefited from their writing, which may have contributed to the lack of differences between conditions.

Solano ⁽⁸⁶⁾ designed a study to assess the effects of WED on the post-operative course in interaction with the different levels of risk accorded to urologic inpatients waiting to undergo transurethral resections of the prostate. In addition to empirical analyses comparing the post-operative courses, Solano analyzed the texts to determine the most frequent themes and attitudes that might provide some explanation about why the low-risk patients benefited from the intervention while the high-risk patients did not. Again, this researcher did not name which particular qualitative method was used, but stated that the “examples quoted should be taken only as illustrations, not as demonstrations, of our clinical findings” (p. 17-18). Even with that disclaimer Solano provided some narrative interpretation of the quotations chosen as illustrations. Using sample quotations from the writings to support the findings, Solano discovered frequent denial, disavowal of feelings, or a prevalence of negative feelings such as anger related to the inconveniences of the hospital in the high risk patients. Low risk patients did not express this complaint, and they were more optimistic and expressed trust in the hospital and staff. Patients who exhibited a larger presence and a progressive increase of positive emotion in their writings appeared to benefit more, while negative emotions appeared on an average level and tended to decrease in these patients. Patients who obtained less or no benefit showed either very high or very low levels of negative emotion, the latter being a possible sign of denial or repression.

Smyth & Helm ⁽⁸¹⁾ examined a chosen case from a previous WED study that evaluated the effectiveness of a self-administered WED manual in asthma patients. In that previous study, participants who completed the WED manual showed significantly greater improvements in lung function from baseline to follow-up in comparison to the

participants who completed a placebo workbook. Even though the selected case study appeared to be the focus of the article and a primary illustration of how a WED intervention can be structured through a workbook, these researchers attached the case study to the end of their article with no introduction or description of their methodology, or explanation as to why they were attaching it. The case study described the client and the presenting problem, the course of treatment, the outcome, and the prognosis. Excerpts from the client's writings were included throughout the article. Excerpts from the first writing session were reproduced verbatim to illustrate that the writing was physically and cognitively chaotic and unstructured. Over the course of writing sessions, the writing became physically more linear and structured and showed greater psychological coherence. In the end the researchers seemed to be using the case study to support the hypothesis that WED might be effective in a self-help format.

Many researchers agree that qualitative inquiry would be helpful in determining why and/or how WED is beneficial. The quality of the qualitative methodology is important to this process. Because doubts about the nature of the qualitative analysis are at the heart of much controversy about qualitative findings (54), reporting that the researcher engaged in a systematic methodology enhances credibility (54, p. 553). While the insights from the narrative analyses cited here contribute to the body of knowledge regarding WED, the researchers failed to provide clear rationale in support of their qualitative methods (37, 71, 81) or a clear description of their methodologies (37, 71, 81, 86).

Other Narrative Analysis Techniques

O'Cleirigh (52) and colleagues compared WED and the processing of trauma between a group of people with AIDS with atypically favorable disease status and a HIV+ comparison group. The essays were evaluated for total number of words and positive and negative emotion words. Then emotional/cognitive processing ratings were assigned according to a coding system previously developed by O'Cleirigh on four specific processes--realistic cognitive appraisal, experiential involvement, positive self-esteem, and adaptive problem solving. This analysis revealed that the healthy survivor group wrote significantly more words, more positive and negative emotion words, and displayed significantly more realistic cognitive appraisal, positive self-esteem, adaptive problem solving, and experiential involvement than the HIV+ comparison group.

O'Cleirigh (52) and colleagues did not mention using LIWC, and it is unclear how the word count was done in their study. It is also unclear whether the coding system used in this study measures something that the LIWC does not (e.g., word count, number of positive and negative words, cognitive processing and sensory dimensions).

Research demonstrates that self-disclosure is a key factor for WED to show therapeutic effect. Research also suggests that prolonged psychological distance-- that is, using fewer first-person singular pronouns--provides a buffering effect after traumatic experiences (73). To reconcile these two seemingly contradictory perspectives, Seih (73) and colleagues used the psychological displacement diary-writing paradigm (PDDP) to balance the effects of self-disclosure and prolonged psychological distance in WED. In this new paradigm participants are instructed to write in their diaries in the first person pronoun first, and then narrate the same event from a different perspective using second

person pronouns. Finally, the participants write again with the third person pronoun from yet another perspective. Forty diaries were randomly selected for content analyses. Two trained raters conducted the content coding. The coding items were generated based on theoretical foundations of the PDDP so that different items targeted the corresponding features of each PDDP phase: self-disclosure in the first-person pronoun phase; self-support in the second person pronoun phase; and objective description in the third person pronoun phase. The average inter-rater reliability was 0.62. Results demonstrated that diary writers benefited from features of PDDP. It also showed that highly anxious people received the most long-term therapeutic effect from PDDP. These researchers argue that PDDP instructions help to balance the effects of self-disclosure and prolonged psychological distancing (using fewer first-person singular pronouns) in WED. This research study involved the manipulation of the WED instructions as well as a different coding system for the narrative analysis. The results seem to support the importance of examining WED essays for a progression in the disclosure—first, emotional disclosure directly expressed; then disclosure that represents a dialogue of self-support; and finally a disclosure that is transformed, objective and from a distant position (73).

Seudfeld & Pennebaker (74) performed a secondary analysis of essays written by undergraduates in a previous WED study. According to these researchers, integrative complexity reflects the level of intellectual resources allocated to coping with a particular situation. They explored whether the recall of very unpleasant memories would occur at a different level of complexity from that of neutral memories, and whether differences in complexity would be related to health outcomes. Complexity scoring was done on a 1-7 scale. In this scale, nodal scores (odd numbers) represented in ascending order of

complexity: lack of differentiation (1), differentiation without integration (3), integration (5), and high-level integration involving overarching concepts (7). Even-numbered scores (i.e., 2, 4, or 6) were assigned when the level of complexity was intermediate between two adjacent nodes. The researchers did not find the predicted linear relationship between beneficial health effects of recalling such events and the amount of intellectual investment in that recall. Instead, moderate complexity, rather than maximal complexity, was associated with health improvement. It may be that, optimally, the writer allocates enough resources to analyze and come to terms with traumatic memories, but that an excessive focus on the topic becomes counter-productive. Participants whose use of cognitive words was high throughout the four days of writing appeared to have entered the study with a predetermined explanation of their traumatic experience. Participants whose accounts evolved over time evidenced better physical health. These researchers suggested that the process of *constructing* a narrative, rather than having a narrative per se, may be the critical ingredient.

Another study manipulated narrative formation during writing to test if narrative structure is necessary for writing to be beneficial. Healthy students were assigned to write about control topics or about the most traumatic event of their life in one of two ways: list in a fragmented format or construct a narrative (85). Essays were coded by three graduate student raters who were first trained by coding 200 essays from a previous writing experiment. Essays were evaluated on a 7-point scale, with scores ranging from 0 (not at all) to 3 (moderately) to 6 (extremely) for how emotional, how personal, and the degree to which they showed narrative structure. Similar to the GREAT code study, narrative structure was defined as showing the organization characteristics of a story, most notably

a clear beginning, middle, and end. Participants given the fragmented expression instructions disclosed similar amounts of emotion, differing from the narrative group only in the degree of narrative use when writing. However, the fragmented writing group was not distinguishable from the control group on any measure. In contrast, the narrative writing group reported less restriction of activity because of illness and, as an unexpected finding, higher avoidant thinking. These researchers point to the fact that a single writing session (as used in this study) might serve as a sensitizing function. In response, participants may actively try to avoid thinking of the traumatic content. Multiple writing sessions may not produce this avoidance response as participants have the opportunity to habituate to the traumatic memory over time. Nevertheless, this study provides further support for narrative formation being required to achieve health benefits from WED.

CHAPTER III

METHODOLOGY

The literature review shows a notable progression in the WED research since it began with Pennebaker and Beall in the mid 1980s. The first research was conducted with healthy college students. Then researchers began to target people who were currently experiencing or had previously experienced stressful events (such as unemployment or a romantic break-up). Researchers then broadened the sample population to people with varying medical ailments, eventually including people who have psychiatric and psychological problems. Today researchers continue to recruit various populations as they focus on the questions of why and for whom WED is beneficial. In their search for the answers to those questions, researchers have examined dose-related variables, topic-related variables, instruction-related variables, audience of disclosure, and mode of disclosure.

My dissertation research joins the ongoing attempt to isolate health-inducing versus unhealthy writing styles. That is, my research deals with the question: “Does the organization (i.e., the coherence and cohesion) of written essays, or the development of this organization over time, influence the health benefits of writing?” This question was prompted by findings in the literature that some researchers are beginning to question whether the health benefits of expressive writing are actually due to writing about emotional topics in an emotional manner, or whether they might possibly be due to formation of coherent essays. According to these researchers, the formation of a coherent

essay allows writers to place a cognitive structure on their experiences that includes an integration of thoughts and feelings related to the experience and a structuring of the content to make it understandable to themselves and others (1, 28, 31-32, 42-43, 61, 74, 85).

Therefore, it is plausible that this cognitive reorganization or integration of thoughts and feelings through the formation of coherent essays allows individuals to reduce the perceived affective intensity of stressful events while simultaneously affording them an increased sense of control over affective experience through the act of linguistic representation (42-43, 61, 100-101). As a result, it is beginning to appear to some researchers that individuals who develop coherent narratives are more likely to show health improvements (56).

The GREAT code shows promise as a tool to assess the organization of the written narratives. Using the GREAT code, organization is coded utilizing sub-rubrics for coherence and cohesion. The coherence score assesses the degree to which an essay has an overall plan or structure, including a related beginning, middle, and conclusion. The cohesion score assesses the degree to which sentences, paragraphs, and ideas transition easily and progressively. These two sub-rubrics are averaged to create an overall organization score (32). Klest and Freyd (32), the developers of this code, encourage continued assessment of the GREAT code's reliability and validity in new and larger sets of writing samples, in different populations, and with diverse essay types. They also encourage researchers to continue to explore the relationship between the organizational score (i.e., the GREAT code ratings of coherence and cohesion of the essay) and health benefits. Klest and Freyd (32) specifically suggested that in addition to scoring the WED essays, scoring the control essays in which participants write emotionally neutral but still

potentially coherent stories might help parse out the relative contributions of emotional expression and coherence in the health benefits of narrative writing (32, 72).

Smyth & Helm (81) found that health benefits of WED were more likely to occur if the writing showed greater psychological coherence over the course of writing sessions. Pennebaker and colleagues in two separate research studies (59, 62) provided supportive indirect evidence that persons whose linguistic categories showed the least amount of change across the days of writing benefited least. In addition, Kaufman & Sexton (28) and Seih et al. (73) found that writers who shift in their use of first person singular pronouns to third person pronouns experienced more health benefits than those who continue to use first person pronouns. Therefore, it is important to continue to test the postulate that researchers (28, 36, 43, 59, 62, 71, 73, 81, 86, 92) are beginning to suggest-- that the *formation* over time of a coherent narrative may be a critical factor necessary for beneficial results.

Additionally, because it is widely agreed that there are multiple mechanisms by which written emotional disclosure operates, understanding these mechanisms may require a detailed study of the individuals who benefit, as well as the content and style of their writings. There are volumes of unexamined but potentially rich data sources that are the written essays of thousands of participants in hundreds of written emotional disclosure studies conducted during the past twenty years. Little attention has been given to the writings of the control groups, except as a manipulation check to test whether the writings differed from the intervention group as expected. Secondary analyses of the collected control and intervention narratives have the potential to help researchers continue to gain insights about the mechanisms by which written emotional disclosure operates.

In this chapter I discuss my research design and introduce my specific research questions related to WED. Then I state my hypotheses and discuss the steps, procedures, and strategies I used for gathering and analyzing the data as related to this dissertation research.

Specific Research Questions

The following specific research questions are addressed: 1) Are the coherence, cohesion and organization ratings of narratives associated with improvements in mental health (i.e., depressed mood and psychological symptoms), physical health (i.e., physical symptoms), and social behaviors (i.e., sexual interest and insurance concerns)? 1a) Are there differences in these associations related to writing instructions? 2) Is the progression of narrative coherence, cohesion and organization ratings over time (i.e., over writing sessions) associated with improvements in mental and physical health and social behaviors? 2a) Are there differences in these associations related to writing instructions? 3) Are the intervention narratives more organized (i.e., do they receive higher coherence and cohesion ratings) than the control narratives? 4) What is the relationship between the length of an essay (i.e., word count) and the organization score?

Hypotheses

As noted earlier, it is beginning to appear that individuals who develop coherent and cohesive narratives are more likely to show health improvements (32, 56) and I focused my research using this theoretical framework. However, I also believe that the various other frequently cited theories related to written emotional disclosure play a significant

role in explaining how and why WED acts as a therapeutic intervention. Because instructions given to the intervention group in this study were similar to instructions given to intervention groups in the majority of the WED studies to date, and because the goal of the instructions was to promote emotional expression I expected the results of the experience for the intervention writers to more likely include emotional processing, cognitive adaptation and problem solving. I also expected that the intervention group instructions would be more conducive to the formation of an organized narrative that promotes assimilation and understanding of the emotional events reducing the emotional arousal.

In this study I intentionally focused on the organization of the written essays in both the intervention and control group writers. In the study conducted by Klest and Freyd (32), the coherence and cohesion of an essay (i.e., the organization scores) were significantly predictive of decreases in physical and mental health symptoms. In another study (85), narrative formation was manipulated such that healthy students were assigned to write about control topics or about the most traumatic event of their life in either a fragmented format or a narrative format. The fragmented writing group was not distinguishable from the control group on any measure. In contrast, the narrative writing group reported less restriction of activity because of illness. Klest and Freyd (32), the developers of the GREAT code used in my research study, encouraged future researchers to score the control essays in which participants write emotionally neutral but still potentially coherent stories to help parse out the relative contributions of emotional expression and organization in the health benefits of writing.

Therefore, I hypothesized that, when scoring essays written by the intervention

and control groups, ratings for coherence, cohesion and organization would be positively correlated with mental and physical health outcomes and social behavior outcomes such that higher coherence, cohesion and organizational scores would predict improvements in depressed mood, psychological symptoms, physical symptoms and social behavior outcomes.

Pennebaker and colleagues in two separate research studies (59, 62) provided supportive indirect evidence that persons whose linguistic categories showed the least amount of change across the days of writing benefited least. Seudfeld & Pennebaker (74) found that participants whose use of cognitive words was high throughout the four days of writing in their research study appeared to have entered the study with a predetermined explanation of their traumatic experience. However, participants whose accounts *evolved* over time evidenced better physical health. These researchers suggested that the process of *constructing* a narrative, rather than having a narrative *per se*, may be the critical ingredient. They join others (28, 36, 43, 59, 62, 62, 71, 73, 92) in suggesting that it is necessary to bring about a *change* in the type of disclosure or *develop* a coherent narrative for there to be health benefits from the intervention. Therefore, I hypothesized that a positive progression of coherence, cohesion and organizational scores over time would be correlated with mental and physical health outcomes and social behavior outcomes such that a progression from lower scores to higher scores would predict improvements in depressed mood, psychological symptoms, physical symptoms and social behaviors.

Pennebaker (56) states that the essence of the writing intervention encompasses theoretical stances associated with self-regulation, search for meaning, creation of coherent stories about one's life, habituation, emotional awareness and expression, as

well as more molecular and molar processes. Researchers conducting WED studies for more than two decades have assumed that intervention group instructions that encourage purposeful expressions of emotions and cognitive components of self-reflection and language processing promote more positive health benefits than the more neutral instructions to the control group (e.g., time management; a typical day's activities; recent eating behaviors; recent caffeine, cigarette or alcohol use; plans for the next several weeks). However, there have been few studies examining the control essays. Klein and Boals (31), after finding no difference between their control and intervention groups on their final measure of working memory (WM), hypothesized that the results may have been influenced by the instructions for the control group. The control group writers in their study were instructed to describe how they had spent the day and then to decide how they might better have spent their time (31). Although there were significant differences in the use of cognitive insight words, the linguistic categories Pennebaker et al. (61) used as markers of narrative cohesion, these instructions may have inadvertently encouraged the formation of more cohesive cognitive representations in the control group writers (31). Further evidence for this suspicion is the finding that participants in both writing groups showed similar increases in cognitive insight words across essays (31).

Klein and Boals (31) designed a second similar experiment, but with attention to the control instructions. In contrast to their first experiment, the control group's instructions warned against any disclosure of emotions and did not ask for any evaluation of the day's schedule (31). As a further precaution against the development of a coherent narrative, the control group was instructed to describe different days each time they wrote. In this second experiment, there were significant differences in final WM scores,

with people assigned to the control group performing more poorly than people who wrote about their negative experiences (31). However, the WM scores of the control group declined as their use of causal words increased. This interaction mirrors one Pennebaker and Francis (140) obtained for the relationship between causal word change and illness. Pennebaker and Francis (140) explained the positive relationship between causal word increases and illness in their control group as an instance of trying to find too much meaning in meaningless events.

Since my dissertation consists of secondary analyses of essays written in a prior research study, there was no attempt to manipulate the writing instructions of either group to promote a cohesive and coherent narrative. The intervention group participants were instructed to write about their deepest thoughts and feelings about how lymphedema and its treatment affected their lives with no regard to grammar, spelling, or sentence structure. The control group participants were instructed to write as objectively as possible about eating behaviors; daily activities; cigarette, alcohol, or caffeine use; and plans for the next several weeks. Although the possibility existed that some of the control essays being analyzed for my dissertation would present as coherent, cohesive and organized essays, I expected that, on average, the total coherence, cohesion and organization scores for all intervention group essays combined would be higher than the total coherence, cohesion and organization scores for all control essays combined.

In a study done by Lutgendorf and Antoni (42), levels of involvement in the disclosure increased from session one to session three whereas quantity of expression (total words) decreased, suggesting that as participants became more accustomed to the disclosure process, they were able to deepen their experiential involvement in the

process. In other words, participants processing at higher levels of involvement emit less verbiage and may instead use more silent reflection on immediate experience (42). However, Klest and Freyd (32) found no correlation between essay fluency (including word count) and essay organization in their initial study using the GREAT coding system.

In this study, the control writers were encouraged to “go into as much factual detail as possible” (S. Ridner, personal communication, April 11, 2009) and the intervention writers were encouraged to “really let go and explore your very deepest emotions and thoughts” (S. Ridner, personal communication, April 11, 2009). In addition, instructions to both groups encouraged writing for the full 20 minutes of the session. Because of the specific writing instructions used in this research study, there was the possibility that the word counts of the control essays and the intervention essays would be similar.

Organization scores represent the coherence and cohesion of the essays. Coherence represents the overall plan and structure of the essay and how it progresses with a beginning, middle and conclusion. The cohesion scores of the essays represent how well the essays transition sentence-to-sentence and topic-to-topic. By definition, it would appear that a coherent and cohesive essay would require the use of more words—to facilitate the construction of the structure of the essay and to provide adequate transitions. Therefore, I hypothesized that the essays with higher organizational scores would also have higher word counts in this study.

Research Design and Data Collection Methods

To answer these research questions and to test these hypotheses I conducted secondary analyses of narratives collected in a previous research project with participants experiencing breast cancer treatment-related lymphedema (LE). The original research project was designed as a randomized, controlled intervention study investigating whether WED might have health benefits for this population.

Little attention has been given to control essays. Rivkin ⁽⁷¹⁾ and colleagues found time management writings often included emotional and thoughtful reflections, and Klest and Freyd ⁽³²⁾ suggested examining and scoring control essays for potentially coherent stories. Therefore, my secondary analyses include the narratives of those assigned to the WED condition and the narratives of those assigned to the control condition in the LE study.

In Frattaroli's ⁽²⁰⁾ meta-analysis of 146 randomized WED studies, the timing of the follow-up or post-test measures (number of months between disclosure and posttest) moderated the effect of experimental disclosure for the overall effect size (less than 1 month, $r = .111$; at least 1 month, $r = .064$) and psychological health effect sizes (less than 1 month, $r = .110$; at least 1 month, $r = .035$) such that studies that followed participants for less than a month after disclosure had larger effect sizes than studies that followed participants for at least a month. The timing of follow-up did not significantly moderate the effect of treatment on reported health or subjective impact effect sizes. The average follow-up time was approximately 3 months after disclosure. Because data is available from the LE study that measures changes in the outcomes at baseline, one-month, three-month, and six-month follow-ups, my study utilizes the data collected at

those time intervals.

Description of the Lymphedema Study and Research Setting

The primary aims of the original lymphedema study were: (1) to determine if WED improves quality of life relative to the control condition in breast cancer survivors with chronic Stage II lymphedema; and (2) to determine if WED improves physical and psychological symptoms/outcomes (e.g., fatigue, psychological distress, activity level, confidence in body) relative to the control condition in breast cancer survivors with chronic lymphedema. Secondary aims were: (1) to explore the influence of individual difference variables (e.g., dispositional optimism, emotional intelligence, and repressive coping) on outcomes associated with this intervention to include identification of subsets of individuals for whom expressive writing is most effective; and (2) to explore the influence of intrusive/avoidant thinking as a mediator between the intervention and outcomes of quality of life and physical and psychological symptoms (S. Ridner, personal communication, April 11, 2009).

The LE study was a randomized clinical trial of the WED intervention. The research design consisted of two groups of breast cancer survivors with Stage II lymphedema. Participants in the experimental group were asked to write about their deepest thoughts and feelings about their lymphedema and its treatment. In the first session, participants in the control group were told to write as objectively as possible about their eating behaviors over the past several weeks. In the second session, the control group wrote about activities performed during a typical day. In session three, the control group wrote about their cigarette, alcohol and caffeine use over the past several

weeks and in the last session they wrote a detailed, factual account of their plans for the next several weeks. Both groups wrote over the course of four, 20-minute sessions -- two sessions each week for two weeks. All writing sessions were spaced 48 hours apart to allow time for rumination. Follow-up took place at three points in time: 1-, 3-, & 6-months post-intervention. To control for body mass (BMI), patients were randomized into the experimental and control groups using a minimization procedure. In this randomization procedure, the first subject was assigned to a group with a coin toss. Subsequent subjects were assigned based upon their BMI and assignment of previous subjects using a computer program. This method of random assignment reduced the probability that groups differed on BMI, a covariate in this study (S. Ridner, personal communication, April 11, 2009).

For the initial visit, participants were seen at the Vanderbilt University School of Nursing or in a private location convenient to and identified by the participant. Height, weight, and arm/skin condition were measured by the research staff pre-intervention. Participants completed demographic, disease and treatment forms, and the empirical measurement instruments pre-intervention. These forms and instruments were completed either on-line at a confidential website or with pencil-and-paper. During the initial visit participants selected the time and dates to complete their writings and received a calendar outlining these dates and dates of follow-up evaluations.

Writing interventions took place in the privacy of the participant's home without supervision of study staff, or, if participants desired, at the Vanderbilt University School of Nursing. Participants selected to complete their writing either on-line or with pen-and-paper. Individuals were phoned by the study staff on the agreed-upon dates and times to

tell them when to begin writing and, again, 20 minutes later, to tell them to stop. During the stop call the study staff determined if participants were interrupted for more than 5 minutes, and they were given additional time if needed. Also, during this stop call the study staff instructed all participants to complete the writing reaction form. Each pen and paper writing and reaction form was mailed as soon as immediately feasible to the study office in self-addressed, postage-paid envelopes. Follow-up data were collected via postal mail or on-line. Data collection took place over seven months at four points in time (S.

Ridner, personal communication, April 11, 2009).

Sample and sampling plan. The accessible population of individuals included in this study was persons who had developed chronic Stage II lymphedema subsequent to breast cancer treatment and who lived within a 90 mile radius of Nashville, TN or were willing to drive to the Vanderbilt campus for a one-time visit (S. Ridner, personal communication, April 11, 2009). In the end, there were participants from 13 different states (S. Ridner, personal communication, October 20, 2011).

Criteria for sample selection. Individuals were included in this study if they: (1) were between the ages of 21 and 80 years; (2) could read, speak, and write English; (3) had Stage II lymphedema as defined by the International Society of Lymphology (i.e., swelling is unrelieved by elevation, arm is hard, may not pit with pressure, skin changes may have taken place); (4) had undergone professional treatment for lymphedema and required life-long at-home self-care, such as compression sleeves; and (5) were willing and able to drive to the study site or agreed to be seen in an outpatient setting (e.g., private therapist office, outpatient clinic, physicians office, or own home). Individuals were not included if they: (1) were actively undergoing intravenous chemotherapy or

radiation therapy; (2) had medical conditions that could cause edema such as: congestive heart failure, chronic/acute renal disease, cor pulmonale, nephrotic syndrome, nephrosis, liver failure, cirrhosis, or were pregnant or expected to become pregnant during the course of the study; (3) were unable to stand upright for measurement of height and weight; (4) had active/metastatic cancer; or (5) had a history of suicide attempts, recent suicidal ideation, or were taking antipsychotic medication (S. Ridner, personal communication, April 11, 2009).

Methods for subject recruitment. Multiple recruiting techniques were used to obtain participants. Breast cancer survivors (over 300) in an existing breast cancer database who had given permission to be contacted for future studies were contacted. An advertisement was posted on-line through The Vanderbilt Medical Center communications and the National Lymphedema Network website. Brochures were distributed with permission to lymphedema therapists, oncologists, cancer centers, breast surgeons, YMCAs, and other breast cancer support groups in the targeted geographical area. The study staff contacted participants to remind them of follow-ups at least one week in advance to minimize attrition. A total of 107 participants were recruited for this study and 52 of these participants were assigned to the intervention group (S. Ridner, personal communication, April 11, 2009). One hundred and four participants completed the study.

Strategies to ensure human subject protection. Permission to conduct the original LE study was obtained from the Vanderbilt Institutional Review Board (IRB). The study was explained, questions were answered, and participants were screened for eligibility criteria. Written informed consent was also obtained. Confidentiality of the participants was maintained by filing consent forms separately, using identification numbers to code

questionnaires, and having password protected computer access. Data were stored in a locking file cabinet or in password protected computer files (S. Ridner, personal communication, April 11, 2009).

Instructions for the intervention group. Instructions for the first WED writing session were as follows:

What we would like you to write about for these four sessions are your deepest thoughts and feelings about how lymphedema and its treatment have affected you and your life. We realize that women with lymphedema experience a full range of emotions, and we want you to focus on any and all of them. In your writing, we want you to really let go and explore your very deepest emotions and thoughts. You might think about all the various feelings and changes that you experienced before being diagnosed with lymphedema, after diagnosis, during lymphedema treatment, and now. You might tie how lymphedema and its treatment has affected you and your relationships with others, including parents, lovers, children, friends, or relatives; you might tie lymphedema to your past, your present, your future, or to who you have been, who you would like to be, or who you are now. Whatever you choose to write, it is critical that you really focus on your deepest thoughts and feelings. Ideally, we would like you to focus on feelings, thoughts, or changes that you have not discussed in great detail with others. Again, the most important part of your writing is that you really focus on your deepest emotions and thoughts. The only rule is that you write continuously for the entire twenty minutes. If you run out of things to say, just repeat what you have already written. Don't worry about grammar, spelling, or sentence structure. Don't worry about erasing or crossing things out. Just write. Don't put your name on your writings. We will call you back in 20 minutes (S. Ridner, personal communication, April 11, 2009).

Instructions for the second WED writing session were similar to the first session except for the beginning which was as follows:

Today we want you to continue to write about your deepest thoughts and feelings about how lymphedema and its treatment have affected you and your life (S. Ridner, personal communication, April 11, 2009).

Instructions for the third WED writing session were similar to the first except for the introduction which was as follows:

You have written now for 2 days. You have today and the next session to finish your writing. As with the first two days, we want you to write about

your deepest thoughts and feelings about how lymphedema and its treatment have affected you and your life. It doesn't matter whether you write the same things as before or whether you write about something new (S. Ridner, personal communication, April 11, 2009).

Instructions for the fourth WED writing session changed the beginning as follows:

You have written now for three days and today is the last one. In your writing today, we again want you to explore your deepest thoughts and feelings about your experience with breast cancer. Remember that this is the last day so you might want to wrap everything up. For example, how is your experience with lymphedema related to your current life and your future? But feel free to go in any direction you feel most comfortable with and really focus on your deepest emotions and thoughts (S. Ridner, personal communication, April 11, 2009).

Instructions for the control group. The instructions for the first control writing session were as follows:

Please write, as objectively as possible, for 20 minutes about your eating behaviors over the past several weeks. You might write about where you eat your meals, such as at home or at a restaurant, how many times a day you eat, the types of foods you eat, how they are prepared and who prepares them. You might also write about your favorite snacks, or about diets you have tried. Try to go into as much factual detail as you can. Please remember: All of your writing will be kept totally confidential. Don't worry about spelling, grammar, or writing good sentences. Please write for only 20 minutes. Please write in pen only. We will call you back in 20 minutes (S. Ridner, personal communication, April 11, 2009).

Instructions for the second control writing session differed as follows:

Please write, as objectively as possible, for 20 minutes about activities you perform during a typical day. You might write about how often you brush or floss your teeth or change your clothes, work activities or tasks, things you do at home (such as read or watch television) or socially with others, or how you spend your leisure time. Try to go into as much factual detail as you can (S. Ridner, personal communication, April 11, 2009).

Instructions for the third control writing session differed as follows:

Please write, as objectively as possible, for 20 minutes about your cigarette use, alcohol use, or caffeine intake (soft drinks, tea, coffee etc) over the past several weeks. You may write about what you like or dislike

about these substances, your favorite brands, how often you use them, or about anything you might have done to change your use of these substances. Try to go into as much factual detail as possible (S. Ridner, personal communication, April 11, 2009).

Instructions for the fourth control writing session differed as follows:

Please write, as objectively as possible, for 20 minutes a detailed, factual account of what you plan to do during the next several weeks. You might write about any trips you plan to take, including where you will go, who you will see, and how long you will be gone. You might write about how many hours a week you plan to work either at home or on a job, and what you plan to do while at home or work. You can also write about any planned shopping activities or purchases you might make, such as new clothes, furniture, or a car. Try to go into as much factual detail as possible (S. Ridner, personal communication, April 11, 2009).

Instruments

Mental health benefits in my current research study are operationalized using measurements of depressed mood/symptoms as assessed by the Center for Epidemiological Studies Depression Scale (CES-D) and the mental health domain scores from the Lymphedema Symptoms Intensity and Distress Scale (LSIDS). Physical health benefits are operationalized using measurements of the physical symptom domain scores from the LSIDS. Social behavior benefits are operationalized using measurements of particular situational symptom scores from the LSIDS. The GREAT code is used to measure the coherence, cohesion and organization of the WED and control essays.

The Center for Epidemiological Studies Depression Scale (CES-D). The CES-D is a 20-item instrument designed to measure a respondent's self-reported current level of depressive symptoms, with emphasis on depressed mood (106). The items of the scale are symptoms associated with depression which have been used in previously validated longer scales (e.g., Beck, Ward, Mendelson, etc.) (106). The major components of the scale

were identified from clinical literature and factor analytic studies (106). Only a few items were selected to represent each component (106). These components include depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disturbances (106). Four items were worded in the positive direction to break tendencies toward response set as well as to assess positive affect (or its absence) (106). On a 4-point scale ranging from 0 ("rarely or none of the time") to 3 ("most or all of the time"), respondents are asked to indicate how often they have experienced each of the symptoms in the last week. A copy of the CES-D is included in appendix A. In the four initial field tests of the scale's reliability, Cronbach's alpha ranged from 0.84 to 0.90. With respect to validity, the scale has been found to distinguish well between psychiatric-inpatient and general-population samples and moderately well among levels of severity within patient groups (104). Psychometric properties of the CES-D have been extensively examined and the scale has been used widely in epidemiological and clinical research. In breast cancer survivors it has a reported Cronbach's alpha of 0.89 (S. Ridner, personal communication, March 17, 2009).

The Lymphedema Symptoms Intensity and Distress Scale (LSIDS). The LSIDS is a revised form of The Symptom Checklist (SC36), previously tested in a lymphedema population (N=149) that had the following internal consistency: number/prevalence alpha= 0.91, distress alpha= 0.95, and intensity alpha = 0.94 (S. Ridner, personal communication, March 17, 2009). The LSIDS requires participants to indicate the presence of a symptom with a "yes" or "no." If a participant indicates that—"yes, a symptom was experienced in the past week"-- then its intensity and distress are then rated on two separate 10 point numeric scales, with 1 representing "slight" and 10 representing "severe" (S. Ridner, personal

communication, March 17, 2009).

Development of the LSIDS was based on the theory of unpleasant symptoms involving situational, psychological, and physical concepts. Phase one of the development included a literature review and expert panel survey. Common symptoms experienced by breast cancer survivors with lymphedema were identified. Then the 36-item LSIDS was tested in two studies of breast cancer survivors with lymphedema (N = 225) (S. Ridner, personal communication, February, 2, 2010). A scoring method was designed to determine lymphedema symptom burden and the weighted global index of symptom burden in these studies had a Cronbach's alpha of 0.95 (S. Ridner, personal communication, February, 2, 2010).

Oblique principal component cluster analyses resulted in eight symptom clusters: arm neurological; arm/skin/movement; arm size; arm pain; psychological; sexual activity; insurance stress; and systemic (or the impact of lymphedema on other body systems); and accounted for 63% of the variance among the items (S. Ridner, personal communication, February, 2, 2010). These symptom clusters corresponded to particular questions in the LSIDS as shown in Table 1 below. A copy of the revised Symptom Checklist-36 is included in appendix B.

Table 1. LSIDS Symptom Clusters and Corresponding Questions

Symptom Cluster	Corresponding questions
Arm neuro symptom	8. warmth in your arm 10. numbness in your arm 14. tingling in your arm 15. pins and needles in your arm
Arm/skin/movement symptom	9. coldness in your arm 16. difficulty moving arm side to side 17. difficulty in raising arm above head 18. flaky skin on your arm
Arm size symptom	1. heaviness in your arm 2. tightness in your arm 12. swelling in your arm 13. hardness in your arm
Arm pain symptom	3. burning pain in your arm 5. stabbing pain in your arm 6. cramping pain in your arm 7. pain in your arm 11. achiness in your arm
Psych symptom	19. sadness 20. anger 21. lack of confidence in self 23. concerns about how you look 24. being misunderstood by spouse/significant other 25. being less sexually attractive 27. loss of confidence in body 33. permanently given up any hobbies or leisure activities 34. consistently decreased social activities 35. decreased level of physical activities
Sex interest symptom	31. lack of interest in sex 32. partner having lack of interest in sex 36. had a decrease in sexual activity
Insurance stress symptom	22. lack of confidence in your insurance provider 26. frustration with your insurance company
Systemic	4. burning pain in your chest 28. fatigue 29. difficulty sleeping 30. increased appetite

The strongest effect size was for the arm size symptom cluster (.239, $p < .001$).

Remaining clusters demonstrated effect sizes ranging from .070 to .093 ($p < .001$), with

the exception of the arm/skin/movement symptom cluster (effect size = .049, $p = .002$) and insurance stress symptom cluster (effect size = .021, $p = .050$) (S. Ridner, personal communication, February, 2, 2010). The LSIDS is a self-report tool that takes 5 minutes to complete and promotes rapid identification of lymphedema and related symptoms; identifies target areas for intervention or education; monitors treatment outcomes; and improves communication between healthcare providers and patients with lymphedema (S. Ridner, personal communication, February, 2, 2010).

The Global Ratings of Essays about Trauma (GREAT code). GREAT code is an analytic rubric with scoring guides for organization created by Klest and Freyd (32) using some criteria from educational rubrics and some criteria developed by the authors. Klest and Freyd (32) pieced together several educational rubrics originally used as models to score the writing of students in second through twelfth grades. They used only the most general parts of each rubric so as to apply equally to writers of varying abilities and varying topics with the goal of creating a code that would not correlate with level of educational attainment, a possible confound with essay quality (32).

Scoring rubrics are guides for assigning scores representing the overall quality of something, placing it into an ordinal category (32). Rubrics differ from other kinds of assessment tools in that they provide descriptions of the characteristics of each scoring level individually (32). For example, in the Klest and Freyd study the raters wanted to assess whether the ideas in an essay connected in such a way that there was good flow from one idea to the next, and whether the ideas came together to form a coherent story (32). This is the type of subjective (and potentially important) quality that a computer program, such as the LIWC, cannot currently evaluate (32). And, unarmed with objective

scoring criteria, two raters might have very different subjective impressions of the same essay (32). However, by using a rubric which lays out criteria for evaluating this subjective factor, it is more likely that raters will agree on the meaning of the factor and in their ratings (32).

In the GREAT coding system, each dimension of the rubric is scored on a 5-point scale, where a score of 1 indicates that the essay is generally uncodable, and a score of 5 indicates excellent demonstration of the trait being scored. Scores of 2, 3, and 4 are assigned to essays falling between these two extremes. Each score is associated with a set of descriptive scoring criteria to assist in making objective ratings. For example, in coding the coherence of an essay the raters are given criteria related to the structure of the essay for each possible score. A score of 3 requires that the writer frequently includes off-topic digressions, a 4 indicates few digressions, and a 5 is given only when there are no off-topic digressions. All scales are ordinal, with higher scores indicating better essays. The rating criteria and complete coding instructions are attached in appendix C.

Organization is coded using the sub-rubrics for coherence and cohesion. The coherence score assesses the degree to which an essay has an overall plan or structure, including a related beginning, middle, and conclusion. The cohesion score assesses the degree to which sentences, paragraphs, and ideas transitioned easily and progressively. These two sub-rubrics are averaged to create an overall organization score (32). Initial coding by two raters was sufficient to achieve reliability statistics between 0.84 and 0.93 for the coding used in data analysis (32).

Word Count. The word count (available in most word-processing programs) is used to score narratives to determine whether computer-calculated essay word count is a

potential confounding factor. Klest and Freyd (32) used Flesch scores instead of word count in their study utilizing the GREAT coding system. Flesch scores are calculated using word count, sentence length, word length, and paragraph length, and reflect readability and “grade level” of a piece of writing (32). According to Klest and Freyd (32), they wanted to rule out the possibility that surface-level factors were influencing organization ratings. In their study, the Flesch scores (which included the word count) were not correlated with rubric-scored organization or with outcome measures (32). Thus fluency was assumed not to be a confounding factor and was left out of the remainder of their analyses (32).

Procedures

Permission from the Vanderbilt IRB was obtained prior to the commencement of this research project. A subset of WED and control essays from another expressive writing study involving persons with diabetes was used for training and practice and to help establish inter-rater reliability. The training took place over three sessions. During the initial session, I reviewed the GREAT coding rubric with the research assistant. The coding instructions were discussed in detail. Then ten essays were coded by the research assistant and me simultaneously discussing our chosen ratings with each other. This practice session helped to clarify how to use coding rubrics and how to record the ratings. Following the practice session, both raters individually read and coded 24 WED and control essays from the diabetes study. Our goal was to have reliability coefficient alphas at or above 0.75 (using intra-class correlation) prior to coding the lymphedema study essays. Reliability statistics for the practice essays following the first training session

were 0.71 for coherence and 0.87 for cohesion. During the second training session, we looked at these 24 coded essays and discussed the discrepancies in our coding. In our third training session, we individually coded 16 WED and control essays from the diabetes study. These were essays that had not been included in the previous training or coding sessions. Reliability coefficient alphas using intraclass correlation were 0.80 for coherence, 0.91 for cohesion, and 0.86 for organization.

A list of random numbers was established using an internet site that utilizes atmospheric noise to produce the randomness. The essays were randomized according to this generated list of numbers. The two raters (the trained research assistant and I) independently read and coded the collected WED and control narratives from the described lymphedema study using the GREAT coding system developed by Klest and Freyd (32). The organizational approach to coding incorporated the suggestions offered by Klest and Freyd (32) in their general instructions (see Appendix C). The essays were read in the assigned random order to ensure that each essay was coded separately and not as a continuation of a previous essay. In addition, to eliminate any “practice” effect, the two raters began from opposite ends of the randomized list of essays to read and code the essays. The two ratings for each essay were averaged for the total cohesion, coherence and organizational scores.

The results of the GREAT coding were recorded on an initial spread sheet that included the subject code and session number, the assigned random number, the coders’ identifications, and their individual ratings for coherence and cohesion. From this spread sheet a separate SPSS data file was constructed where these essay coding data were entered. The SPSS data file was merged with the original data from the lymphedema

study (specifically the CES-D and LSIDS measures along with basic descriptive information).

Inter-rater reliabilities were checked using intra-class correlation. As noted by Klest and Freyd (32) in their initial research developing and using the GREAT code, intraclass correlation is acceptable for use with both continuous and ordinal data, which makes it particularly useful in cases of continuous data with a somewhat restricted range. Inter-rater reliabilities were first computed for each coding category (i.e., coherence, cohesion, organization) using all essays individually—four essays from each participant. Then essays from the various writing sessions were evaluated separately for reliability.

In an attempt to minimize the maximum amount of error, the average of the two raters' scores was used. Next, for simplicity of later data analysis, a single score in each category (i.e., coherence, cohesion, organization) was computed for each participant by calculating the average score for that participant for all four essays. Reliabilities for these composite scores were also calculated using intra-class correlation. For the essays written in the first three writing sessions the inter-rater reliabilities were statistically significant but moderately inter-related (0.54, 0.53, and 0.57). For the final writing session, the inter-rater reliability coefficient alphas using intra-class correlation were statistically significant and substantially inter-related at 0.76.

Reliability statistics for the other measurements used in this study are shown in Table 2 below.

Table 2. Instrument Measurements Reliability Statistics

<i>Measures</i>	<i>Cronbach's Alpha</i>	<i>N of Items</i>
<i>CES-D</i>	<i>.888</i>	<i>20</i>
<i>LSIDS arm neuro symptom intensity</i>	<i>.726</i>	<i>4</i>
<i>LSIDS arm neuro symptom distress</i>	<i>.776</i>	<i>4</i>
<i>LSIDS arm/skin/movement symptom intensity</i>	<i>.726</i>	<i>4</i>
<i>LSIDS arm/skin/movement symptom distress</i>	<i>.799</i>	<i>4</i>
<i>LSIDS arm size symptom intensity</i>	<i>.890</i>	<i>4</i>
<i>LSIDS arm size symptom distress</i>	<i>.863</i>	<i>4</i>
<i>LSIDS arm pain symptom intensity</i>	<i>.865</i>	<i>5</i>
<i>LSIDS arm pain symptom distress</i>	<i>.884</i>	<i>5</i>
<i>LSIDS psych symptom intensity</i>	<i>.895</i>	<i>10</i>
<i>LSIDS psych symptom distress</i>	<i>.905</i>	<i>10</i>
<i>LSIDS sex interest symptom intensity</i>	<i>.748</i>	<i>3</i>
<i>LSIDS sex interest symptom distress</i>	<i>.777</i>	<i>3</i>
<i>LSIDS insurance stress symptom intensity</i>	<i>.939</i>	<i>2</i>
<i>LSIDS insurance stress symptom distress</i>	<i>.942</i>	<i>2</i>
<i>LSIDS systemic intensity</i>	<i>.600</i>	<i>4</i>
<i>LSIDS systemic distress</i>	<i>.638</i>	<i>4</i>
<i>LSIDS overall symptom intensity</i>	<i>.935</i>	<i>36</i>
<i>LSIDS overall symptom distress</i>	<i>.946</i>	<i>36</i>

Management of Instrument Outcome Data

According to Ridner, in her original lymphedema study, the data that participants provided via the internet were not cleaned as the computer forced the participants to respond within an acceptable range for the outcome instruments. The data from participants who completed the instruments by hand were doubled entered and then checked for accuracy. The computer generated essays were not cleaned but were converted to word files. Essays written by hand were typed into word documents and then compared to the handwritten documents by a second person (S. Ridner, personal communication, December 15, 2011). No further data transformation was done for purposes of these secondary analyses.

As detailed in the next chapter, the analyses conducted for the first two sets of hypotheses involved follow-up measures being regressed on baseline measures to create

the equivalent of change scores. These analyses are more appropriately done with raw scores than with transformed scores. Because the research was exploratory in nature the alpha for Type I error was set at .10 to decrease the risk of missing a relationship that might actually be present but might be missed with a more conservative alpha setting.

CHAPTER IV

RESULTS

As noted previously, in the GREAT coding system *organization* is coded using the sub-rubrics for *coherence* and *cohesion*. The coherence score assesses the degree to which an essay has an overall plan or structure and the cohesion score assesses the degree to which sentences, paragraphs, and ideas transition easily and progressively. Therefore, consideration was given as to whether the coherence, cohesion, and organization ratings would be treated separately. Because analyses revealed that coherence and cohesion were highly intercorrelated at 0.87, indicating a high degree of overlap, only organization scores were used in the remaining analyses.

Data Analyses

First, descriptive statistical analyses were conducted on demographic data to describe the sample population as a whole and then to show the characteristics of intervention and control writer groups separately. Demographic data of the study participants are summarized in Table 3. The intervention and control writing groups were not statistically different on age, BMI, race, marital status, education level, work status, income status, or type of insurance ($p = 0.05$).

Table 3. Demographic Data

<i>Characteristics</i>	<i>Combined Sample n (%)</i>	<i>Intervention Group n (%)</i>	<i>Control Group n (%)</i>	<i>p</i>
<i>Race</i>				<i>.180</i>
<i>White</i>	87 (83.7)	40 (78.4)	47 (88.7)	
<i>African American</i>	14 (13.5)	10 (19.6)	4 (7.5)	
<i>Other</i>	3 (2.9)	1 (2.0)	2 (3.8)	
<i>Marital Status</i>				<i>.071</i>
<i>Single</i>	21 (20.2)	15 (29.4)	6 (11.3)	
<i>Married</i>	76 (73.1)	33 (64.7)	43 (81.1)	
<i>Widowed</i>	7 (6.7)	3 (5.9)	4 (7.5)	
<i>Household income, US \$</i>				<i>.676</i>
<i>≤ 30,000</i>	9 (8.7)	6 (11.8)	3 (5.7)	
<i>30,000-60,000</i>	29 (27.9)	13 (25.5)	16 (30.2)	
<i>> 60,000</i>	55 (52.9)	26 (51.0)	29 (54.7)	
<i>Do not care to respond</i>	11 (10.6)	6 (11.8)	5 (9.4)	
<i>Education</i>				<i>.914</i>
<i>≤ 12th grade</i>	24 (23.1)	12 (23.5)	12 (22.6)	
<i>> 12th grade</i>	80 (76.9)	39 (76.5)	41 (77.4)	
<i>Work Status</i>				<i>.115</i>
<i>Employed full time</i>	43 (41.3)	23 (45.1)	20 (37.7)	
<i>Employed part time</i>	22 (21.2)	12 (23.5)	10 (18.9)	
<i>Homemaker</i>	10 (9.6)	3 (5.9)	7 (13.2)	
<i>Retired</i>	21 (20.2)	7 (13.7)	14 (26.4)	
<i>Unemployed</i>	7 (6.7)	6 (11.8)	1 (1.9)	
<i>Other</i>	1 (1.0)	0 (0.0)	1 (1.9)	
<i>Insurance</i>				<i>.267</i>
<i>Medicare Only</i>	4 (3.8)	0 (0.0)	4 (7.5)	
<i>Medicare with supplement</i>	17 (16.3)	8 (15.7)	9 (17.0)	
<i>Medicaid</i>	1 (1.0)	1 (2.0)	0 (0.0)	
<i>Tenn Care</i>	4 (3.8)	2 (3.9)	2 (3.8)	
<i>Private Insurance</i>	67 (64.4)	32 (62.7)	35 (66.0)	
<i>HMO</i>	5 (4.8)	4 (7.8)	1 (1.9)	
<i>Other</i>	6 (5.8)	4 (7.8)	2 (3.8)	
<i>BMI, mean (SD)</i>	30.5 (± 6.8)	30.9 (± 7.5)	30.0 (± 6.5)	<i>.500</i>

Descriptive statistical analyses were also conducted to obtain an overall picture of how many words were used in the varying essays and the results of the organization scoring for those essays. As shown in Table 4, the averaged word counts of the

expressive writers were consistently higher than the averaged word counts of the control writers across writing sessions.

Table 4. Comparing Word Counts of Intervention and Control Group Writers

Writing Session	Group	N	Minimum	Maximum	Mean	SD
1	Intervention	51	3.00	807.00	451.20	198.44
	Control	53	3.00	790.00	392.08	207.56
2	Intervention	51	1.00	808.00	461.10	200.64
	Control	53	1.00	804.00	427.66	222.82
3	Intervention	51	1.00	794.00	483.24	190.15
	Control	53	1.00	720.00	357.34	184.50
4	Intervention	51	1.00	800.00	485.22	225.01
	Control	52	1.00	795.00	398.88	224.03

An initial examination of the essays of both the expressive writers and the control writers together revealed that the average number of words used in the essays at each of the four writing sessions was fairly consistent (between 419 and 444 words). The maximum number of words in a single essay written at a particular writing session was between 794 and 808 words. Some essays, however, were very short and could be considered to be outliers. Outliers (the essays with only three or less words) and the effects of these outliers on the descriptive statistics were given consideration. In the original research study, essays were given a word count of 1 if, for some reason, the data were lost (for example, if the computer shut off during the writing session and the data could not be retrieved). In this situation, technically the participant had completed the writing session as instructed, but what she had written was lost. Adjusting for outliers (i.e. deleting essays with three or less words), the second and last writing sessions

prompted the higher number of words in the essays (M = 486 words in the second essay, and 489 words in the fourth essay).

Table 5 shows the results of comparing the mean and standard deviation of total organization scores for the intervention and control group essays separately and the combination of those essays together. In the intervention group essays, the control group essays and the combined group essays, the mean organization scores across writing sessions show a gradual decrease in scores over the writing sessions and a decrease in scores from the early sessions to the late sessions.

Table 5. Comparing Total Organization Scores Over Writing Sessions

Writing Group	Session 1 Mean (SD) N	Session 2 Mean (SD) N	Session 3 Mean (SD) N	Session 4 Mean (SD) N	Early Mean (SD) N	Late Mean (SD) N
Intervention	4.16 (.62) 48	4.11 (.59) 47	4.02 (.53) 49	4.04 (.77) 47	4.09 (.59) 51	4.08 (.76) 51
Control	4.14 (.56) 47	4.08 (.60) 48	3.91 (.64) 49	3.89 (.77) 48	4.08 (.51) 53	3.96 (.78) 53
Combined	4.15 (.58) 95	4.10 (.59) 95	3.96 (.92) 98	3.96 (.77) 95	4.09 (.55) 104	4.02 (.77) 104

The remaining analyses were based on the stated research hypotheses. Baseline measures of the outcomes were included as covariates in a series of regression analyses to determine what proportion of *change* in outcome scores were attributable to the organization ratings of the essays. Then similar regression analyses were conducted to determine if the change scores in the organization of the written essays (from the early essays to the later essays) predicted change scores in the health and social outcomes at various time intervals. In both sets of regression analyses each variable was treated independently. Organization scores from the first and second writing session were

averaged for the early essay score. Organization scores from the third and fourth writing session were averaged for the late essay score. Then, late essay scores were regressed on the early essay scores to compute the standardized residual scores which, in effect, functioned as change in organization score. A positive residual (change) score means the organization of the essays increased over time. Regressions were performed using the residualized change in organization scores over time as predictors of changes in mental and physical health outcomes and social behavior outcomes. Then, the t-test was used to assess whether the means of the organization ratings of the intervention and control essays were statistically different from each other. Finally, to test the extent to which the length of an essay predicts organization rating the word counts of the essays were regressed on organization scores.

Hypothesis 1

First, it was hypothesized that the ratings for organization (i.e., the averaged scores across the writing sessions) would be positively correlated with changes in mental and physical health outcomes and social behavior outcomes (at each follow-up point) such that higher organization scores would predict improvements in depressed mood, psychological symptoms, physical symptoms and social behaviors. Baseline measures of the outcomes were included as covariates in a series of regression analyses to determine what proportion of change in outcome scores was attributable to the GREAT coded organization scores of the essays.

Contribution of averaged organization scores to CES-D scores. As Table 6 shows, when analyzing the intervention and control group essays together, higher

averaged organization essay scores over writing sessions predicted changes in reported depressive symptoms (CES-D scores) at the 3-month follow-up ($\Delta R^2 = 0.020$, $p = 0.077$, $\beta = -0.142$) in the expected direction, but were not predictive of changes in depressed mood at the 1-month and 6-month follow-ups. Analyzing the intervention group essays only, the averaged organization scores of the essays over writing sessions predicted changes in CES-D scores at the 6-month follow-up ($\Delta R^2 = 0.054$, $p = 0.075$, $\beta = -0.233$) in the expected direction, but this predictive value was not replicated at the 1-month or 3-month follow-ups. Averaged organization scores were not predictive of changes in depressed mood in the control group writers.

Table 6. Contribution of Averaged Organization Scores to Changes in Depressed Mood (CES-D) From Baseline to Follow-Up

Health Outcome	Follow-up point	Combined Writers	Intervention Writers	Control Writers
Depressed Mood (CES-D)	1-mo	•	•	•
	3-mo	$\Delta R^2 = .020$, $\beta = -.142^\dagger$	•	•
	6-mo	•	$\Delta R^2 = .054$, $\beta = -.233^\dagger$	•

• no significant findings

$^\dagger p < .10$ $^{\prime\prime} p < .05$ $* p < .01$

Contribution of averaged organization scores to total number LSIDS scores.

Averaged organization scores over the writing sessions were not predictive of the changes in total number of LSID symptoms reported at any follow-up point in any group of writers.

Combined group writers and changes in LSIDS scores. Again, baseline measures of the LSIDS outcomes were included as covariates in a series of regression analyses to

determine what proportion of change in outcome scores were attributable to the organization ratings of the essays. As shown in Table 7, when looking at the combined group of intervention and control writers, higher averaged organization scores over writing sessions predicted changes in arm neurological symptom burden scores at the 1-month ($\Delta R^2 = 0.021, p = 0.087, \beta = 0.150$) and 6-month follow-ups ($\Delta R^2 = 0.022, p = 0.085, \beta = 0.154$), but in the opposite direction expected. Higher averaged organization scores predicted changes in arm size symptom intensity scores at the 6-month follow-up ($\Delta R^2 = 0.020, p = 0.067, \beta = 0.144$), but not at the 1-month and 3-month follow-ups, but again in the opposite direction expected. Averaged organization scores over writing sessions predicted changes in arm pain symptom distress scores ($\Delta R^2 = 0.024, p = 0.059, \beta = -0.155$) in the predicted direction and changes in psychological symptom burden scores ($\Delta R^2 = 0.014, p = 0.087, \beta = 0.116$) at the 1-month follow-up, but not in the expected direction and not at the other follow-up points. Averaged organization scores predicted changes in sex interest symptom intensity scores in the intervention and control group writers combined at the 3-month follow-up ($\Delta R^2 = 0.027, p = 0.038, \beta = 0.166$) and at the 6-month follow-up ($\Delta R^2 = 0.029, p = 0.032, \beta = 0.175$), but not at the 1-month follow-up and not in the predicted direction. Averaged organization scores over writing sessions also predicted changes in sex interest symptom distress ($\Delta R^2 = 0.019, p = 0.045, \beta = 0.137$) and burden ($\Delta R^2 = 0.025, p = 0.020, \beta = 0.159$) scores at the 6-month follow-up, but not in the expected direction. Higher averaged organization scores also predicted changes in insurance stress symptom intensity scores at the 3-month follow-up ($\Delta R^2 = 0.034, p = 0.026, \beta = -0.184$) and in the predicted direction when analyzing intervention and control essays together. Higher organization scores predicted changes in overall

symptom intensity scores for the combined group of writers at the 1-month ($\Delta R^2 = 0.015$, $p = 0.089$, $\beta = -0.122$) and 6-month follow-ups ($\Delta R^2 = 0.082$, $p = 0.082$, $\beta = 0.131$) in the predicted direction, but this result was not replicated at the 3-month follow-up.

In the combined groups, averaged organizational scores over writing sessions were not predictive of changes in scores related to arm neurological symptom intensity and distress; arm/skin/movement intensity, distress, and burden; arm size distress and burden; arm pain intensity and burden; psychological symptom intensity and distress; insurance stress symptom distress and burden; systemic intensity, distress, and burden; and overall symptom distress and burden.

Intervention group writers and changes in LSIDS scores. The same regression analyses were performed on the intervention and control groups separately. When examining the intervention group only, averaged organization scores over writing sessions predicted change in arm neurological burden scores ($\Delta R^2 = 0.060$, $p = 0.026$, $\beta = 0.257$) at the 3-month follow-up, but not in the expected direction. Averaged organization scores predicted change in arm size symptom intensity scores at the 6-month follow-up in the intervention group ($\Delta R^2 = 0.056$, $p = 0.052$, $\beta = 0.244$), but this result was not replicated at the other follow-up points and was not in the expected direction. Averaged organization scores predicted change in psychological burden scores at the 6-month follow-up in the intervention group ($\Delta R^2 = 0.027$, $p = 0.049$, $\beta = -0.165$), and in the expected direction. Again, examining the intervention writers' essays only, organization scores predicted change in sex interest symptom intensity scores at the 1-month follow-up ($\Delta R^2 = 0.120$, $p = 0.001$, $\beta = 0.356$), the 3-month follow-up ($\Delta R^2 = 0.097$, $p = 0.022$, $\beta = 0.321$) and the 6-month follow-up ($\Delta R^2 = 0.154$, $p = 0.001$, $\beta = 0.416$), but not in the

expected direction. Averaged organization scores predicted change in sex interest burden scores ($\Delta R^2 = 0.038$, $p = 0.021$, $\beta = 0.196$) at the 6-month follow-up, but not in the expected direction. Averaged organization scores predicted change in insurance stress symptom intensity scores in the expected direction ($\Delta R^2 = 0.053$, $p = 0.081$, $\beta = -0.231$) at the 3-month follow-up, and in insurance stress symptom distress scores in the predicted direction ($\Delta R^2 = 0.095$, $p = 0.024$, $\beta = -0.309$) at the 6-month follow-up when analyzing the intervention essays. In analyzing the intervention group essays only, the averaged organization scores of the essays predicted changes in overall symptom intensity scores at the 1-month follow-up ($\Delta R^2 = 0.035$, $p = 0.013$, $\beta = 0.190$), at the 3-month follow-up ($\Delta R^2 = 0.031$, $p = 0.089$, $\beta = 0.179$) and 6-month follow-up ($\Delta R^2 = 0.028$, $p = 0.072$, $\beta = 0.169$).

In analyzing the intervention group essays only, averaged organization scores over writing sessions were not predictive of changes in symptoms related to arm neurological symptom intensity and distress; arm/skin/movement symptom intensity, distress and burden; arm size symptom distress and burden; arm pain symptom intensity, distress and burden; psychological symptom intensity and distress; sex interest symptom distress; insurance symptom burden; systemic symptom intensity, distress and burden; and overall symptom distress and burden. These results are shown in Table 7.

Control group writers and changes in LSIDS scores. The organization scores of the control writers predicted change in arm pain symptom intensity scores at the 1-month follow-up ($\Delta R^2 = 0.046$, $p = 0.077$, $\beta = -0.215$) in the expected direction, but this correlation disappears at the 3-month and 6-month follow-ups. Organization scores predicted changes in psychological symptom distress scores at the 6-month follow-up

($\Delta R^2 = 0.028$, $p = 0.074$, $\beta = 0.168$), but not in the expected direction and this correlation was not replicated at the other follow-up points. Averaged organization scores over writing sessions predicted changes in sex interest symptom distress at the 6-month follow-up only ($\Delta R^2 = 0.018$, $p = 0.091$, $\beta = 0.135$), but not in the expected direction. Averaged organization scores predicted changes in the expected direction in insurance symptom burden scores at the 3-month follow-up only ($\Delta R^2 = 0.042$, $p = 0.038$, $\beta = -0.206$) in the control writing group. Organization scores predicted changes in systemic burden scores at the 6-month follow-up ($\Delta R^2 = 0.057$, $p = 0.062$, $\beta = 0.242$), but not in the expected direction.

Averaged organization scores over writing sessions were not predictive of changes in the following symptoms in the control group writers: arm neuro symptom intensity, distress, and burden; arm/skin/movement symptom intensity, distress, and burden; arm size intensity, distress, and burden; arm pain symptom distress and burden; psychological symptom intensity and burden; sex interest symptom intensity and burden; insurance symptom intensity and distress; systemic intensity and distress; and overall symptom intensity distress and burden. These results are shown in Table 7 below.

Table 7. Contribution of Averaged Organization Scores to Changes in LSIDS Scores From Baseline to Follow-Up

Health Outcome	Follow-up point	Combined Writers	Intervention Writers	Control Writers
Arm neuro symptom intensity	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•
Arm neuro symptom distress	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•
Arm neuro symptom burden	1-mo	$\Delta R^2 = .021, \beta = .150^\dagger$	•	•
	3-mo	•	$\Delta R^2 = .060, \beta = .257^{**}$	•
	6-mo	$\Delta R^2 = .022, \beta = .154^\dagger$	•	•
Arm/skin/movement symptom intensity	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•
Arm/skin/movement symptom distress	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•
Arm/skin/movement symptom burden	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•
Arm size symptom intensity	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	$\Delta R^2 = .020, \beta = .144^\dagger$	$\Delta R^2 = .056, \beta = .244^\dagger$	•
Arm size symptom distress	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•

Table 7, continued.

Arm size symptom <i>burden</i>	1-mo 3-mo 6-mo	• • •	• • •	• • •
Arm pain symptom <i>intensity</i>	1-mo 3-mo 6-mo	• • •	• • •	$\Delta R^2 = .046, \beta = -.215^\dagger$ • •
Arm pain symptom <i>distress</i>	1-mo 3-mo 6-mo	$\Delta R^2 = .024, \beta = -.155^\dagger$ • •	• • •	• • •
Arm pain symptom <i>burden</i>	1-mo 3-mo 6-mo	• • •	• • •	• • •
Psych symptom <i>intensity</i>	1-mo 3-mo 6-mo	• • •	• • •	• • •
Psych symptom <i>distress</i>	1-mo 3-mo 6-mo	• • •	• • •	• • $\Delta R^2 = .028, \beta = .168^\dagger$
Psych symptom <i>burden</i>	1-mo 3-mo 6-mo	$\Delta R^2 = .014, \beta = .116^\dagger$ • •	• • $\Delta R^2 = .027, \beta = -.165''$	• • •
Sex interest symptom <i>intensity</i>	1-mo 3-mo 6-mo	• $\Delta R^2 = .027, \beta = .166''$ $\Delta R^2 = .029, \beta = .175''$	$\Delta R^2 = .120, \beta = .356^*$ $\Delta R^2 = .097, \beta = .321''$ $\Delta R^2 = .154, \beta = .416^*$	• • •
Sex interest symptom <i>distress</i>	1-mo 3-mo 6-mo	• • $\Delta R^2 = .019, \beta = .137''$	• • •	• • $\Delta R^2 = .018, \beta = .135^\dagger$
Sex interest symptom <i>burden</i>	1-mo 3-mo 6-mo	• • $\Delta R^2 = .025, \beta = .159''$	• • $\Delta R^2 = .038, \beta = .196''$	• • •

Table 7, continued.

Insurance stress symptom <i>intensity</i>	1-mo	•			•
	3-mo		$\Delta R^2 = .034, \beta = -.184^{**}$		$\Delta R^2 = .053, \beta = -.231^{\dagger}$
	6-mo	•			•
Insurance stress symptom <i>distress</i>	1-mo	•			•
	3-mo	•			•
	6-mo	•		$\Delta R^2 = .095, \beta = -.309^{**}$	•
Insurance stress symptom <i>burden</i>	1-mo	•			•
	3-mo	•			$\Delta R^2 = .042, \beta = -.206^{**}$
	6-mo	•			•
Systemic <i>intensity</i>	1-mo	•			•
	3-mo	•			•
	6-mo	•			•
Systemic <i>distress</i>	1-mo	•			•
	3-mo	•			•
	6-mo	•			•
Systemic <i>burden</i>	1-mo	•			•
	3-mo	•			•
	6-mo	•			$\Delta R^2 = .057, \beta = .242^{\dagger}$
Overall symptom <i>intensity</i>	1-mo		$\Delta R^2 = .015, \beta = -.122^{\dagger}$		$\Delta R^2 = .035, \beta = .190^{**}$
	3-mo	•			$\Delta R^2 = .031, \beta = .179^{\dagger}$
	6-mo		$\Delta R^2 = .082, \beta = -.131^{\dagger}$		$\Delta R^2 = .028, \beta = .169^{\dagger}$
Overall symptom <i>distress</i>	1-mo	•			•
	3-mo	•			•
	6-mo	•			•
Overall symptom <i>burden</i>	1-mo	•			•
	3-mo	•			•
	6-mo	•			•

• no significant findings

$\dagger p < .10$ $^{**} p < .05$ $^{*} p < .01$

Hypothesis 2

Analyses were based on the hypothesis that a positive progression of essay organization scores over time would be correlated with mental and physical health outcomes and social behavior outcomes such that a progression from lower organization scores to higher organization scores would predict improvements in depressed mood, psychological symptoms, physical symptoms and social behaviors at each follow-up point. Baseline measures of the outcomes were included as covariates in a series of regression analyses using the residualized change in organization scores over time as predictors of changes in mental and physical health outcomes and social behaviors. Each variable was treated independently.

Contribution of organization scores over time to CES-D scores. As shown in Table 8, a change in organization scores of the essays (from less to more organized) over time predicted a reported change in depressive symptoms at the 3-month follow-up in the expected direction when analyzing the intervention and control groups together ($\Delta R^2 = 0.024$, $p = 0.051$, $\beta = -0.156$). However, this relationship was no longer statistically significant at the 6-month follow-up although the trend was in the same direction. When analyzing the writing groups separately, at the 3-month follow-up only the change in organization scores of the essays over time predicted a change in CES-D scores in the expected direction in the intervention group ($\Delta R^2 = 0.051$, $p = 0.043$, $\beta = -0.225$). A change in organization scores over time was not predictive of changes in CES-D scores in the control group writers. See Table 8 below.

Table 8. Contribution of Change in Organization Scores Over Time to Changes in Depressed Mood (CES-D) From Baseline to Follow-Up

Health Outcome	Follow-up point	Combined Writers	Intervention Writers	Control Writers
Depressed Mood (CES-D)	1-mo 3-mo 6-mo	• $\Delta R^2 = .024, \beta = -.156 \dagger$ •	• $\Delta R^2 = .051, \beta = -.225 \ddot{}$ •	• • •

• no significant findings
 $\dagger p < .10$ $\ddot{ } p < .05$ $* p < .01$

Contribution of organization scores over time to total number LSIDS. When analyzing the intervention and control groups together, a change in organization scores over time predicted change in total number of LSIDS scores reported at the 1-month follow-up ($\Delta R^2 = 0.010, p = 0.093, \beta = -0.100$), the 3-month follow-up ($\Delta R^2 = 0.020, p = 0.058, \beta = -0.140$) and the 6-month follow-up ($\Delta R^2 = 0.031, p = 0.013, \beta = -0.176$). All of these results were in the expected direction. When examining the intervention group writers only, change in organization scores over time (from less organized to more organized) predicted a change in the number of reported symptoms on the LSIDS at the 6-month follow-up ($\Delta R^2 = 0.058, p = 0.015, \beta = -0.242$) in the expected direction, but these findings were not replicated at the 1-month and 3-month follow-up points. When looking at the control group writers, a change in organization in their essays (from less organized to more organized) predicted a change in the number of reported symptoms on the LSIDS at the 1-month ($\Delta R^2 = 0.026, p = 0.088, \beta = -0.163$) and 3-month ($\Delta R^2 = 0.029, p = 0.076, \beta = -0.175$) follow-up points and in the expected direction, but these results were not replicated at the 6-month follow-up. These results are shown in Table 9 below and are a sharp contrast to the results found when analyzing the predictive power

of averaged organization scores and total number of reported symptoms on the LSIDS as shown in Table 9.

Table 9. Contribution of Change in Organization Scores Over Time to Changes in the Total Number of Reported Symptoms in the LSIDS from Baseline to Follow-Up

Health Outcome	Follow-up point	Combined Writers	Intervention Writers	Control Writers
Total reported Symptoms (LSIDS)	1-mo	$\Delta R^2 = .010, \beta = -.100 \dagger$	•	$\Delta R^2 = .026, \beta = -.163 \dagger$
	3-mo	$\Delta R^2 = .020, \beta = -.140 \dagger$	•	$\Delta R^2 = .029, \beta = -.175 \dagger$
	6-mo	$\Delta R^2 = .031, \beta = -.176 \ddot{}$	$\Delta R^2 = .058, \beta = -.242 \ddot{}$	•

• no significant findings

$\dagger p < .10$ $\ddot{ } p < .05$ $* p < .01$

Combined group writers and changes in LSIDS scores. When examining the intervention and control group essays combined, a change in organization scores from less to more organized over the four writing sessions predicted a change in the arm pain symptom distress scores at the 1 month follow-up ($\Delta R^2 = 0.019, p = 0.089, \beta = -0.139$) in the expected direction, but the results were not replicated at the 3-month and 6-month follow-ups. Change in organization scores over writing sessions predicted sex interest symptom intensity scores ($\Delta R^2 = 0.018, p = 0.094, \beta = 0.136$) at the 3-month follow-up point and predicted sex interest symptom distress scores at the 6-month follow-up ($\Delta R^2 = 0.020, p = 0.038, \beta = 0.143$), but not in the expected direction. Change in organization scores over writing sessions predicted sex interest symptom burden scores at the 3-month follow-up ($\Delta R^2 = 0.013, p = 0.099, \beta = -0.114$) in the expected direction. A progressive change in organization scores from less to more organized over time predicted a change in insurance stress symptom intensity scores ($\Delta R^2 = 0.051, p = 0.006, \beta = -0.226$) at the

3-month follow-up in the predicted direction and in insurance stress symptom burden score at the 6-month follow-up in the predicted direction ($\Delta R^2 = 0.080$, $p = 0.004$, $\beta = -0.283$). These results were not replicated at the other follow-up points in LSIDS scores related to insurance in the combined intervention and control group writers.

When looking at the combined groups change in organization scores over writing sessions from early sessions to later sessions were not predictive of changes in the following LSIDS symptom clusters: arm neuro symptom intensity, distress and burden; arm/skin/movement symptom intensity, distress and burden; arm size symptom intensity, distress and burden; arm pain symptom intensity and burden; psychological symptom intensity, distress and burden; insurance distress; systemic intensity, distress and burden; and overall symptom intensity, distress and burden. These results are presented in Table 10.

Intervention group writers and changes in LSIDS scores. The change in organization scores of the intervention group essays from early scores to late scores predicted the arm size intensity scores ($\Delta R^2 = 0.328$, $p = 0.091$, $\beta = 0.134$) at the 6-month follow-up point, but not at any other follow-up points and not in the expected direction. Change in organization scores in this writing group predicted change in psychological symptom burden scores at the 6-month follow-up ($\Delta R^2 = 0.042$, $p = 0.013$, $\beta = -0.205$) in the predicted direction. Change in organization scores in the intervention writers predicted insurance stress symptom intensity scores at the 3-month follow-up ($\Delta R^2 = 0.147$, $p = 0.003$, $\beta = -0.388$) and insurance stress symptom burden scores at the 6-month follow-up ($\Delta R^2 = 0.226$, $p = 0.001$, $\beta = -0.477$) and predicted both in the expected direction. But when examining insurance symptom distress, change in organization

scores (from early to late scores) predicted change in insurance symptom distress scores at the 6-month follow-up ($\Delta R^2 = 0.097$, $p = 0.019$, $\beta = .311$) but not in the expected direction. Change in organization scores predicted systemic burden scores ($\Delta R^2 = 0.037$, $p = 0.084$, $\beta = -.192$) and overall symptom intensity scores ($\Delta R^2 = 0.208$, $p = 0.073$, $\beta = -0.135$) of the LSIDS only at the 6 month follow-up points and in the expected direction. In the intervention writers, change in organization scores over writing sessions from early sessions to later sessions were not predictive of changes in the following LSIDS symptom clusters: arm neurological symptom intensity, distress and burden; arm/skin/movement symptom intensity, distress and burden; arm size symptom distress and burden; arm pain symptom intensity, distress and burden; psychological symptom intensity and distress; sex interest symptom intensity, distress and burden; systemic symptom intensity and distress; and overall symptom distress and burden. These results are presented in Table 10.

Control group writers and changes in LSIDS scores. When examining the control group writers only, change in organization scores over writing sessions from early sessions to later sessions were not predictive of changes in the following LSIDS symptom clusters: arm neurological symptom intensity, distress and burden; arm/skin/movement symptom intensity, distress and burden; arm size symptom intensity, distress and burden; arm pain symptom intensity and burden; psychological symptom intensity and burden; sex interest symptom distress; insurance stress symptom intensity and distress; systemic symptom intensity and distress; and overall symptom intensity, distress and burden.

In the control group writers only, change in organization scores (from early to

late) predicted change in arm pain symptom distress scores at the 1-month follow-up ($\Delta R^2 = 0.086, p = 0.011, \beta = -0.295$) in the expected direction, but this correlation was not replicated at the 3-month and 6-month follow-ups. In this group of writers, change in organization scores predicted change in psychological symptom distress scores at the 6-month follow-up ($\Delta R^2 = 0.025, p = 0.094, \beta = 0.158$), but not in the expected direction and not at other follow-up points. Change in organization scores over time, from early to late scores, predicted change in sex interest symptom intensity ($\Delta R^2 = 0.018, p = 0.095, \beta = -0.134$) and burden ($\Delta R^2 = 0.018, p = 0.095, \beta = -0.134$) scores at the 3-month follow-up and in the expected direction, but these results were not replicated at the other follow-up points. Change in organization scores over time predicted change in insurance stress symptom burden scores at the 3-month follow-up ($\Delta R^2 = 0.062, p = 0.011, \beta = -0.250$) in the predicted direction. When examining control writers only, change in organization scores over time approached predicted systemic symptom burden scores ($\Delta R^2 = 0.049, p = 0.085, \beta = 0.222$) at the 6-month follow-up only but not in the expected direction. These results are presented in Table 10 below.

Table 10. Contribution of Change in Organization Scores Over Time to Changes in LSIDS Scores From Baseline to Follow-Up

Health Outcome	Follow-up point	Combined Writers	Intervention Writers	Control Writers
Arm neuro symptom <i>intensity</i>	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•
Arm neuro symptom <i>distress</i>	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•
Arm neuro symptom <i>burden</i>	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•
Arm/skin/movement symptom <i>intensity</i>	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•
Arm/skin/movement symptom <i>distress</i>	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•
Arm/skin/movement symptom <i>burden</i>	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•
Arm size symptom <i>intensity</i>	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	$\Delta R^2 = .328, \beta = .134 \dagger$	•
Arm size symptom <i>distress</i>	1-mo	•	•	•
	3-mo	•	•	•
	6-mo	•	•	•

Table 10, continued.

Arm size symptom <i>burden</i>	1-mo 3-mo 6-mo	• • •	• • •	• • •
Arm pain symptom <i>intensity</i>	1-mo 3-mo 6-mo	• • •	• • •	• • •
Arm pain symptom <i>distress</i>	1-mo 3-mo 6-mo	$\Delta R^2 = .019, \beta = -.139 \dagger$ • •	• • •	$\Delta R^2 = .086, \beta = -.295^{**}$ • •
Arm pain symptom <i>burden</i>	1-mo 3-mo 6-mo	• • •	• • •	• • •
Psych symptom <i>intensity</i>	1-mo 3-mo 6-mo	• • •	• • •	• • •
Psych symptom <i>distress</i>	1-mo 3-mo 6-mo	• • •	• • •	$\Delta R^2 = .025, \beta = .158 \dagger$ • •
Psych symptom <i>burden</i>	1-mo 3-mo 6-mo	• • •	$\Delta R^2 = .042, \beta = -.205^*$ • •	• • •
Sex interest symptom <i>intensity</i>	1-mo 3-mo 6-mo	• $\Delta R^2 = .018, \beta = .136 \dagger$ •	• • •	• $\Delta R^2 = .018, \beta = -.134 \dagger$ •
Sex interest symptom <i>distress</i>	1-mo 3-mo 6-mo	• • $\Delta R^2 = .020, \beta = .143^{**}$	• • •	• • •
Sex interest symptom <i>burden</i>	1-mo 3-mo 6-mo	• $\Delta R^2 = .013, \beta = -.114 \dagger$ •	• • •	• $\Delta R^2 = .018, \beta = -.134 \dagger$ •

Table 10, continued.

Insurance stress symptom <i>intensity</i>	1-mo	•		•	
	3-mo		$\Delta R^2 = .051, \beta = -.226 *$		$\Delta R^2 = .147, \beta = -.388 *$
	6-mo	•		•	
Insurance stress symptom <i>distress</i>	1-mo	•		•	
	3-mo	•			$\Delta R^2 = .097, \beta = .311 "$
	6-mo	•		•	
Insurance stress symptom <i>burden</i>	1-mo	•		•	
	3-mo	•		•	$\Delta R^2 = .062, \beta = -.250 "$
	6-mo		$\Delta R^2 = .080, \beta = -.283 *$	$\Delta R^2 = .226, \beta = -.477 *$	•
Systemic <i>intensity</i>	1-mo	•		•	
	3-mo	•		•	
	6-mo	•		•	
Systemic <i>distress</i>	1-mo	•		•	
	3-mo	•		•	
	6-mo	•		•	
Systemic <i>burden</i>	1-mo	•		•	
	3-mo	•		•	
	6-mo	•		$\Delta R^2 = .037, \beta = -.192 †$	$\Delta R^2 = .049, \beta = .222 †$
Overall symptom <i>intensity</i>	1-mo	•		•	
	3-mo	•		•	
	6-mo	•		$\Delta R^2 = .208, \beta = -.135 †$	
Overall symptom <i>distress</i>	1-mo	•		•	
	3-mo	•		•	
	6-mo	•		•	
Overall symptom <i>burden</i>	1-mo	•		•	
	3-mo	•		•	
	6-mo	•		•	

• no significant findings

† $p < .10$ " $p < .05$ * $p < .01$

Hypothesis 3

It was hypothesized that the averaged total organization scores for all intervention group essays combined would be higher than the averaged total organization scores for all control essays combined. As shown in Table 11, the averaged organization scores of the intervention group essays were consistently higher than the averaged organization scores of the control group essays; however, the means of the organization ratings of these two groups of essays were not statistically different from each other. Therefore, the hypothesis was not supported.

Table 11 also shows that the averaged *early* organization scores for the intervention and control group essays differed by only 0.01 points and the averaged *late* organization scores for the intervention and control group essays differed by 0.12. For the intervention group, the averaged organization scores for the earlier essays differed from those for the later essays by only -0.01. For the control group, the equivalent difference was -0.12. So, the two groups started off writing equally organized essays, but the organization of the control group essays decreased over time. However, despite this differential decrease, the organization scores of the control and intervention writers were not statistically different at any writing session or from the early to late sessions.

Table 11. Comparing Organization Scores of Control and Intervention Writers

Writing session	Group	N	Mean	SD	t	DF	p
1	Intervention	48	4.16	.616	.193	92	.848
	Control	47	4.14	.556			
2	Intervention	47	4.11	.592	.232	93	.817
	Control	48	4.08	.598			
3	Intervention	49	4.02	.530	.947	93	.346
	Control	49	3.91	.639			
4	Intervention	47	4.04	.772	.991	93	.324
	Control	48	3.89	.773			
1-2 (Early)	Intervention	51	4.09	.593	.141	99	.888
	Control	53	4.08	.511			
3-4 (Late)	Intervention	51	4.08	.756	.837	102	.405
	Control	53	3.96	.776			

Hypothesis 4

It was hypothesized that there would be a positive correlation between computer-calculated essay word counts and essay organization scores in both the control and intervention group essays such that essays with higher word counts would also have higher organization scores. Table 12 shows the average word counts of the intervention and control group essays in each writing session. In general, word counts were higher in the intervention group essays, and reached significance in Session 3 and 4.

Table 12. Comparing Word Counts of Control and Intervention Writers

Writing Session	Group	N	Mean	SD	t	DF	p
1	Intervention	51	451.20	198.44	1.485	100	.141
	Control	53	392.08	207.56			
2	Intervention	51	461.10	200.64	.805	102	.423
	Control	53	427.66	222.82			
3	Intervention	51	483.24	190.15	3.425	102	.001
	Control	53	357.34	184.50			
4	Intervention	51	485.22	225.01	1.951	101	.054
	Control	52	398.88	224.03			

To test the extent to which the length of an essay is associated with organization rating, the word counts of essays were regressed on organization scores. The averaged word counts of the essays were significantly and positively correlated with the averaged organization scores of the essays, and those correlations increased over each of the four writing sessions from 0.22 ($p < 0.05$) for session 1 to 0.46 ($p < 0.01$) for session 4.

CHAPTER V

DISCUSSION

Previous research in the field of written emotional disclosure found the writing intervention to be beneficial for psychological health, physical health, and overall functioning in certain populations (58, 140). However, the overriding issue that continues to direct research in this area is the fact that no one has been able to determine precisely how or why writing in this manner results in positive changes. By conducting this dissertation study, I join other scientists in attempting to isolate health-inducing writing styles. Specifically, I consider the theory that the cognitive reorganization or integration of thoughts and feelings through the formation of coherent and cohesive essays might contribute to health and social behavior improvements (56). My research questions focused on whether essay organization (i.e., ratings of the coherence and cohesion of the essays) and/or the progression of essay organization over time (i.e., over four writing sessions spread over two weeks) are associated with health and social behavior improvements; whether intervention narratives (i.e., written emotional disclosure narratives) are more organized than control narratives (i.e., writing objectively about neutral topics); and whether there is a relationship between the length of an essay and its organization.

In this chapter I discuss the meanings of my findings in relation to my hypotheses. Then I present the significance of my research findings in light of prior written emotional disclosure (WED) research studies and the implications of my research findings for

nursing practice. And finally, I point out the limitations of my study and outline my recommendations for future research in this area.

Meaning of Findings in Relation to Hypotheses

After a literature review of 108 previous WED studies conducted over the past 12 years, my current research was based on the following hypotheses: 1) ratings for essay organization are positively correlated with improvements in mental health (i.e., depressed mood and psychological symptoms), physical health (i.e., physical symptoms), and social behaviors (i.e., sexual interest and insurance concerns); 2) an increasing progression of organization scores over writing sessions is positively correlated with mental and physical health outcomes and social behaviors; 3) the WED (or intervention) essays are more organized than the control essays; and 4) the longer essays, those with higher word counts, are judged to be more organized.

The pioneer in written emotional disclosure research, James Pennebaker (56), based his research on the theory that the WED protocol was associated with self-regulation, search for meaning, and the creation of coherent stories about one's life, emotional awareness and expression. Most researchers following Pennebaker's lead have assumed that intervention group instructions encouraged more purposeful expressions of emotions and cognitive components of self-reflection and language processing than the more neutral instructions to the control group. However, several researchers have raised questions about this assumption (31, 32, 72, 85, 140) including Klein and Boals (31) who found no difference between their control and intervention groups on their final measure of working memory. They hypothesized that the results may have been influenced by the

instructions for the control group (i.e., to describe how they had spent the day and then to decide how they might better have spent their time) (31). Klein and Boals (31) felt these instructions may have inadvertently encouraged the formation of more cohesive cognitive representations in the control group writers (31). Because of the suspicions raised by these former researchers and because there have been very few studies that examined the control writers' essays, I chose to conduct exploratory analyses examining the writings of the intervention group writers *and* control group writers both as a combined group and as separate groups in attempting to support my hypotheses.

Hypotheses 1 and 2

I expected that participants writing more organized essays (i.e., the averaged organization scores across writing sessions) and/or showing a progression of narrative organization over time (i.e., from the early writing sessions to the late writing sessions) would experience better mental and physical health outcomes and social behavior outcomes at each follow-up point (i.e., 1-month, 3-month, and 6-month follow-ups). These hypotheses were only partially supported. Some support for these hypotheses was evident when examining variables dealing with depressed mood and psychological symptoms and with variables relating to arm pain, sex interest, insurance stress, systemic burden, overall symptom intensity and the total number of reported symptoms on the LSIDS. However, the support was not consistent throughout the writing groups (i.e., the combined writers, the intervention writers, and the control writers) or the follow-up points. Table 13 displays the supportive evidence showing the health outcomes that were

significantly correlated to average organization scores or change in organizational scores over time in the direction expected.

Table 13. Averaged Organization Scores and Change in Organization Scores Over Writing Sessions as Predictors of Positive Health and Social Behavior Outcomes

<i>Health Outcome</i>	<i>Combined Groups</i>	<i>Intervention Group</i>	<i>Control Group</i>
<i>Arm pain symptom intensity</i>			
<i>Averaged organization scores</i>			†1-mo f/u
<i>Arm pain symptom distress</i>			
<i>Averaged organization scores</i>	†1-mo f/u		
<i>ΔOrganization scores over time</i>	†1-mo f/u		†1-mo f/u
<i>Psych symptom burden</i>			
<i>Averaged organization scores</i>		†6-mo f/u	
<i>ΔOrganization scores over time</i>		*6-mo f/u	
<i>Sex interest symptom intensity</i>			
<i>ΔOrganization scores over time</i>			†3-mo f/u
<i>Sex interest symptom burden</i>			
<i>ΔOrganization scores over time</i>	†3-mo f/u		†3-mo f/u
<i>Insurance stress symptom intensity</i>			
<i>Averaged organization scores</i>	†3-mo f/u	†3-mo f/u	
<i>ΔOrganization scores over time</i>	*3-mo f/u	*3-mo f/u	
<i>Insurance stress symptom distress</i>			
<i>Averaged organization scores</i>		†6-mo f/u	
<i>Insurance stress symptom burden</i>			
<i>Averaged organization scores</i>			†3-mo f/u
<i>ΔOrganization scores over time</i>	*6-mo f/u	*6-mo f/u	†3-mo f/u

Table 13, continued.

<i>Systemic burden</i>				
<i>ΔOrganization scores over time</i>				<i>†6-mo f/u</i>
<i>Overall symptom intensity</i>				
<i>Averaged organization scores</i>		<i>†1-mo, †6-mo f/u</i>		
<i>ΔOrganization scores over time</i>				<i>†6-mo f/u</i>
<i>Total number LSIDS symptoms</i>				
<i>ΔOrganization scores over time</i>	<i>†1-mo, †3-mo, †6-mo f/u</i>	<i>†6-mo f/u</i>		<i>†1-mo, †3-mo f/u</i>
<i>CES-D Scores</i>				
<i>Averaged organization scores</i>	<i>†3-mo f/u</i>		<i>†6-mo f/u</i>	
<i>ΔOrganization scores over time</i>	<i>†3-mo f/u</i>		<i>†3-mo f/u</i>	

† $p < .10$ †† $p < .05$ * $p < .01$

Arm pain. The variable “arm pain” in the LSIDS refers to questions related to general pain and achiness in the arm as well as burning, stabbing and cramping pain in the arm. As noted earlier, the LSIDS requires participants to indicate the presence of a symptom with a “yes” or “no.” If a participant affirms that a symptom was experienced in the past week, then the participant is asked to rate how intense this symptom was and how distressed she was by the symptom on two separate 10 point numeric scales, with 1 representing “slight” and 10 representing “severe” (S. Ridner, personal communication, March 17, 2009). Average organization scores of essays predicted ($p < .10$) a change in the reported intensity of arm pain in the control writers at the 1-month follow-up, but this result was not replicated in the intervention writers or at other follow-up points. In other words, control writers who wrote more organized essays about neutral topics were more likely to report a decrease in the intensity of their arm pain at the 1-month follow-up. Also, when

looking at the control writers only, the change in organization scores over writing sessions (from early to late) predicted ($p < .05$) a decrease in the distress related to arm pain at the 1-month follow-up.

According to many previous researchers, the timing of follow-ups in WED studies can have consequences for effect sizes. For example, the participants disclosing emotional thoughts and feelings related to lymphedema secondary to breast cancer could find the process to be difficult and upsetting initially (thus the nonsignificant findings related to their arm pain at the 1-month follow-up point). Following that line of reasoning, writing about neutral topics in a cohesive and coherent manner might provide some type of cognitive reorganization effect or even a meditative effect that might influence pain intensity. When the control group was combined with the intervention group, the averaged organization scores and the change in organization scores over writing sessions also predicted ($p < .10$) how distressed the participant was over the pain in her arm at the 1-month follow-up. Again, these results were not replicated when examining the intervention writers only.

Psychological symptoms. Psychological symptoms in the LSIDS refer to confidence issues: a lack of confidence in oneself, a loss of confidence in one's body, being less sexually attractive and/or concerns about how one's body looks. In addition, the psychological symptom cluster refers to decreased physical activities including permanently giving up hobbies or leisure activities or a decrease in social activities, emotions such as sadness and anger, and being misunderstood by one's spouse or significant other.

Averaged organization scores and change in organization scores over writing

sessions predicted ($p < .05$) changes in psychological symptom burden scores in the intervention group writers at the 6-month follow-up. In other words, participants who were wrote emotionally about dealing with lymphedema in a more organized manner, or who developed an organized essay over writing sessions reported less psychological symptom burden on the LSIDS. These results were not replicated at the other follow-up points or in the control writers or combined group writers. However, averaged organization scores and change in organization scores over writing sessions predicted ($p < .10$) more distress related to psychological symptoms in the control writers at the 6-month follow-up.

Again, the timing of the follow-up perhaps influenced the results. Participants disclosing emotional thoughts and feelings related to their lymphedema might find the process to be difficult and upsetting initially (thus the nonsignificant findings related to psychological symptoms at the earlier follow-up points). In fact, averaged organization scores predicted ($p < .10$) an increase in psychological symptom burden scores at the 1-month follow-up in the combined group of writers. Some researchers believe there is a period of negative mood prior to seeing the benefits of WED (showing up here at the 6-month follow-ups in the intervention group writers).

Also, when looking at the LSIDS as a whole, considering how distressing the symptoms are to the participants is also a measurement of psychological/emotional functioning. In this study, organization scores predicted distress related to arm pain ($p < .10$) in the combined group writers and control group writers at the 1-month follow-up, and distress related to insurance stress ($p < .05$) in the intervention group writers at the 6-month follow-up.

The CES-D is considered a measurement of depression and includes a list of ways a person might feel or behave if depressed. This list includes being bothered by things that usually do not bother the person, and/or feeling one's life has been a failure; having a poor appetite, restless sleep or lack of motivation; experiencing difficulty concentrating or difficulty shaking off the blues; feeling depressed, fearful, sad or lonely; or feeling people do not like them or that they are not as good as other people. Averaged organization scores predicted ($p < .10$) lower reported CES-D scores at the 3-month follow-up point for the combined groups and at the 6-month follow-up point for the intervention group. A change in organization scores over writing sessions predicted ($p < .10$) a lower number of reported depressive symptoms at the 3-month follow-up point in the combined writing group, and predicted ($p < .05$) lower reported CES-D scores in the intervention writers at the 3-month follow-up. Again, as mentioned previously, participants disclosing emotional thoughts and feelings might find the process to be upsetting initially which would explain the benefits not showing up until the 3-month follow-up point.

Sex interest symptoms. The sex interest symptom cluster in the LSIDS corresponds to questions relating to a lack of interest in sex, a partner's lack of interest in sex; and/or a decrease in sexual activity. In the control group writers, change in organization scores across the writing sessions predicted ($p < .10$) a positive change in sex interest intensity and burden symptoms at the 3-month follow-up periods only. This result was replicated when examining the combined groups at the 3-month follow-up. There were several significant ($p < .05$) and highly significant correlations ($p < .01$) involving sex interest and organization scores, but all in the unexpected direction (i.e., the

more cohesive and coherent the essays were, the more the participants reported a lack of interest in sex or decreased sexual activity). Here it should be noted that in the LSIDS, the questions dealing with sex add the option of “preferring not to answer” to the “yes” and “no” options. This is the only category in the LSIDS that adds this option (see Appendix B). In this particular study, 24 participants chose not to answer the questions related to sex at baseline and the 1-month and 3-month follow-ups, and 31 participants chose not to answer the questions related to sex at the 6-month follow-up (See Appendix D). This choice altered the number of subjects and perhaps led to selection bias (e.g., participants with extreme views only answering the questions).

Insurance stress. Frustration with insurance has generally not been addressed in the WED literature. However, in this research study, there were significant correlations between organization scores of the writers and their confidence in and/or frustration with their insurance providers. The majority of the participants in this study had insurance through private companies or HMOs ($n = 72$). The remaining participants were insured by Medicare ($n = 4$), Medicare with a supplement ($n = 17$), Medicaid ($n = 1$), Tenn Care ($n = 4$), and other ($n = 6$).

Averaged organization scores over writing sessions predicted a reported positive change in the way participants felt about their insurance (i.e., insurance stress symptom intensity) at the 3-month follow-up point for the combined groups ($p < .05$) and the intervention group ($p < .10$). Participants in the intervention group who wrote more organized essays also reported less distress over insurance at the 6-month follow-up ($p < .05$). A change in the organization scores over time in the combined group writers and in the intervention group writers predicted ($p < .01$) less insurance symptom intensity at the

3-month follow-up points. Change in organization scores over the writing sessions predicted a change in insurance stress symptom burden scores in the intervention group writers and combined group writers at the 6-month follow-up ($p < .01$). When examining insurance stress symptom burden, even the control group writers who had higher average organization scores and a progression of organization in their essays reported less frustration with and more confidence in their insurance providers at the 3-month follow-up ($p < .05$).

Systemic burden. The systemic cluster of the LSIDS includes questions related to fatigue, difficulty sleeping, increased appetite and burning pain in the chest. A change in organization scores over writing sessions predicted systemic burden scores in the intervention group at the 6-month follow-up point ($p < .10$). In other words, the writers who wrote about their experiences with lymphedema in an emotional way and who developed a coherent and cohesive essay over the writing sessions reported less symptom burden relating to fatigue, sleep, appetite and chest pain. However, the organization scores of the control group writers predicted a reported increase in these symptoms.

Overall symptom intensity. In the combined group of intervention and control writers, correlations ($p < .10$) were noted between organization scores and changes in overall symptom intensity scores at the 1- month and 6-month follow-ups in the predicted direction with the more organized writers reporting a decrease in overall symptom intensity. When looking at the change in organization scores over time, this change predicted overall symptom intensity in the expected direction at the 6-month follow-up in the intervention group writers ($p < .10$). There were no significant findings when looking at the correlations between averaged essay organization scores or progression of

organization scores over time and reported overall symptom intensity in the control writing group.

Total number of reported LSIDS symptoms. Possibly the strongest evidence for the importance of forming a coherent and cohesive narrative over time shows up when looking at the correlations involving the total number of reported symptoms in the LSIDS. The total number of reported symptoms in the LSIDS correlated with a progression in organization scores over time and showed up in all the writing groups and at varying follow-up points (See Table 9). In the combined group writers, the correlations increased from the first to last follow-up point indicating that writers who showed a progression in their essay organization also reported a decreasing progression of total number of reported symptoms. In the intervention group alone this correlation did not show up until the final follow-up point, but was significant ($p < .05$). Even in the control group significant correlations ($p < .10$) were noted at the first two follow-up points between the total number of symptoms reported and the progression of organization over time. It is interesting to note that in the original research study using the GREAT coding system, Klest and Freyd (32) found no significant or marginally significant effects using the change scores for organization. It is unclear how they obtained their change scores, however.

Comparing LSIDS intensity, distress and burden. In a continuing attempt to synthesize the results of the regression analyses conducted for the first two research questions, the significant correlations between essay organization and the change in LSIDS intensity, distress, and burden scores are presented in Tables 14 -17 below.

When focusing on the first research question concerning whether averaged organization scores are predictors of health outcomes we can see that there are correlations in the expected direction in four symptom clusters (arm pain, insurance stress, psychological and overall). There is little consistency in the results regarding the writing group or follow-up points. Averaged organization scores were predictive of reported positive health outcomes related to the intensity of symptoms (5 occurrences), distress of symptoms (2 occurrences), and burden of symptoms (2 occurrences). See Table 14 below.

Table 14. Averaged Organization Scores as Predictors of Intensity, Distress and Burden Outcomes in Expected Direction

Symptom	Intensity	Distress	Burden
Arm pain	Control Group (1-month f/u)	Combined Groups (1-month f/u)	
Insurance stress	Combined Groups (3-month f/u)		Control Group (3-month f/u)
	Intervention Group (3-month f/u)	Intervention Group (6-month f/u)	
Psych			Intervention Group (6-month f/u)
Overall	Combined Groups (1-month and 6-month f/u)		

It is also important to report significant correlations in the unexpected direction. These results are shown in Table 15 below.

Table 15. Averaged Organization Scores as Predictors of Intensity, Distress and Burden Outcomes in Unexpected Direction

Symptom	Intensity	Distress	Burden
Psych		Control Group (6-month f/u)	Combined Group (1-month f/u)
Arm neuro			Combined Groups (1-month and 6-month f/u) Intervention Group (3-month f/u)
Arm size	Combined Groups (6-month f/u) Intervention Group (6-month f/u)		
Sex interest	Combined Groups (3-month and 6-month f/u) Intervention Group (all f/u points)	Combined Groups (6-month f/u) Control Group (6-month f/u)	Combined Groups (6-month f/u) Intervention Group (6-month f/u)
Systemic			Control Group (6-month f/u)
Overall	Intervention Group (all f/u points)		

Again, when focusing on the first research question concerning whether averaged organization scores are predictors of health outcomes we can see that there are correlations in even more symptom clusters (psychological, arm neurological and size, sex interest, systemic and overall) in the direction not expected. In other words, organized essays were predictive of more symptom intensity, distress and burden in these

clusters. There is little consistency in the results regarding the writing group or follow-up points. Averaged organization scores were predictive of reported health outcomes in an unexpected direction in outcomes related to the intensity of symptoms (10 occurrences), distress of symptoms (3 occurrences), and burden of symptoms (6 occurrences).

When focusing on the second research question concerning whether a change in organization scores over writing sessions are predictors of health outcomes we can see that there are correlations in the expected direction in six symptom clusters (arm pain, insurance stress, psychological, overall, sex interest and systemic). There is little consistency in the results regarding the writing group or follow-up points. Averaged organization scores were predictive of reported positive health outcomes related to the intensity of symptoms (4 occurrences), distress of symptoms (2 occurrences), and burden of symptoms (7 occurrences). See Table 16 below.

Table 16. Change in Organization Scores Over Writing Sessions as Predictors of Intensity, Distress and Burden Outcomes in Expected Direction

Symptom	Intensity	Distress	Burden
Arm pain		Combined Groups (1-month f/u) Control Group (1-month f/u)	
Insurance stress	Combined Groups (3-month f/u) Intervention Group (3-month f/u)		Combined Groups (6-month f/u) Intervention Group (6-month f/u) Control Group (3-month f/u)
Psych			Intervention Group (6-month f/u)
Overall	Intervention Group (6-month f/u)		
Sex interest	Control Group (3-month f/u)		Combined Groups (3-month f/u) Control Group (3-month f/u)
Systemic			Intervention Group (6-month f/u)

Again, when focusing on the second research question concerning whether a change in organization scores over writing sessions predict of health outcomes we can see that there are some correlations in certain symptom clusters (insurance stress, psychological, sex interest and systemic) in the direction not expected. There is little

consistency in the results regarding the writing group or follow-up points. Change in organization score over time predicted reported health outcomes in an unexpected direction in outcomes related to the intensity of symptoms (2 occurrences), distress of symptoms (3 occurrences), and burden of symptoms (1 occurrence). See Table 17 below.

Table 17. Change in Organization Scores Over Writing Sessions as Predictors of Intensity, Distress and Burden Outcomes in Unexpected Direction

Symptom	Intensity	Distress	Burden
Insurance stress		Intervention Group (3-month f/u)	
Psych		Control Group (6-month f/u)	
Sex interest	Combined Groups (3-month f/u)	Combined Groups (6-month f/u)	
Systemic			Control Group (6-month f/u)
Arm size	Intervention Group (6-month f/u)		

In summary, there is some limited support for the hypotheses that the averaged ratings for organization and the positive progression of essay organization scores over time are positively correlated with changes in mental and physical health outcomes and social behavior outcomes such that higher organization scores and a progression from lower organization scores to higher organization scores predict improvements in depressed mood, psychological symptoms, physical symptoms and social behaviors. There appears to be stronger support for the formation of a coherent and cohesive

narrative over writing sessions affecting health outcomes positively, however such conclusions must be made cautiously.

Hypothesis 3

I expected that the averaged total organization scores for the intervention group essays would be higher than the averaged total organization scores for the control group essays. This hypothesis was not supported. When examining the organizational scores of the intervention group essays and the control group essays over each writing session it was noted that the intervention group essays were consistently rated a little higher on organization than the control group essays. However, the means of the organization scores of the intervention and control group essays were not statistically different. Therefore, the participants in both the intervention group and the control group were writing essays that were similar in regards to coherence, cohesion and organization even though the writing instructions were very different.

There are several possible explanations for this finding. First, the participant characteristics for both the intervention and control groups were similar in that that they were females who were breast cancer survivors with Stage II lymphedema. The descriptive statistical analyses conducted on the demographic data supported the similarity in the groups. In addition, randomization minimizes allocation bias, balancing both known and unknown prognostic factors.

Secondly, both the control and intervention groups were given the same amount of time to write and the same number of sessions in which to write. In addition, the control group was given detailed instructions about what to write. For example, in the

first writing session the control group was told to write about their eating behaviors over the past several weeks. Then they were given these additional instructions:

You might write about where you eat your meals, such as at home or at a restaurant, how many times a day you eat, the types of foods you eat, how they are prepared and who prepares them. You might also write about your favorite snacks, or about diets you have tried. Try to go into as much factual detail as you can.

They were also encouraged to go into as much factual detail as they could. Similar detailed instructions were given to the control group at the following writing sessions regarding how they should write about their typical daily activities; their cigarette and alcohol use, and their caffeine intake; and their plans for the next several weeks. Thus indirectly the instructions themselves might have influenced the organization of those essays.

The intervention group instructions may have also encouraged writing an organized essay. Not only were they asked to write about their deepest thoughts and feelings about how lymphedema and its treatment affected them and their life, they were also given the following detailed instructions:

You might think about all the various feelings and changes that you experienced before being diagnosed with lymphedema, after diagnosis, during lymphedema treatment, and now. You might tie how lymphedema and its treatment has affected you and your relationships with others, including parents, lovers, children, friends, or relatives; you might tie lymphedema to your past, your present, your future, or to who you have been, who you would like to be, or who you are now.

However, in encouraging the intervention writers to write for the entire 20 minutes, they were told that if they ran out of things to say they could repeat what they had already written. These instructions, it would seem, might have influenced essay organization negatively. Another influence on essay organization might have come in regards to the

length of time the writers had been dealing with their lymphedema. The emotional expression writers might possibly have given thought to their narratives for years regarding the difficulty living with their condition. They may have somewhat organized the narratives about their life with lymphedema before they enrolled in the study and had the opportunity to record their thoughts and feelings in a written form.

Therefore, even though the two groups of writers were given different writing instructions (i.e., to write about your deepest thoughts and feelings about how lymphedema affected you and your life versus to write objectively about eating behaviors, activities of a typical day, substance use and future plans) there is some logic as to why these women wrote similarly organized essays.

Hypothesis 4

I expected that the essays with higher word counts would also have the higher organization scores. This hypothesis was supported. The averaged word counts of the essays significantly and positively correlated with the averaged organization scores and these correlations increased over the writing sessions from the first session to the last session.

Klest and Freyd (32), in developing the GREAT coding system, pieced together several educational rubrics originally used as models to score the writing of students. They used only the most general parts of each rubric so as to apply to writers of varying abilities and with varying topics. Their goal was to create a coding system that would not correlate with level of educational attainment (32). They also wanted the rubrics to act as objective scoring criteria in an attempt to limit subjectivity in the scoring. However,

humans scoring essays by reading them even with rubrics is by definition somewhat subjective. Here it should be noted that in their study, Klest and Freyd found that word count scores were not correlated with rubric-scored organization or with outcome measures (32).

Therefore, it is possible that researcher bias influenced this outcome. The two raters in this dissertation research were related (the author and her daughter). In addition, I trained my daughter in how to use the GREAT coding system. It is possible that I was biased toward the longer essays (and gave them higher organization scores) and while training my daughter influenced her as well.

Significance in Light of Prior Research Findings

Prior to this research study many scientists had confirmed that written emotional disclosure has the potential to be a cost-effective, time-efficient, therapeutic intervention that could possibly be used as a self-help and/or preventive measure, either initiated by patients themselves or by health care providers including nurses. Most WED studies, particularly in the early years of this research paradigm, did not explore *how* participants wrote but focused on whether there were positive health outcomes. However, during the past decade scientists have become more interested in how written emotional disclosure works and for whom. A few studies have begun to show that some ways of writing are more likely to yield health improvements than other ways of writing. This dissertation research was an attempt to further understand the underlying mechanisms of the WED intervention and to help target the ways written emotional disclosure can be used more successfully in producing positive health outcomes. Specifically, I was trying to

determine if the formation of a coherent and cohesive narrative was important in achieving health benefits from the writing intervention.

A literature review of studies done within the past 12 years confirmed that text analyses have been generally limited to content summaries of the intervention essays or computer analyses of the intervention writings using the Linguistic Inquiry Word Count program (LIWC). Klest and Freyd (32), the developers of the GREAT coding system for analyzing written essays by determining their level of coherence, cohesion, and organization, were the first to conduct WED research using the GREAT coding system and they used the coding system to score intervention essays only. My dissertation is the second documented study to use the GREAT coding system to score the organization of essays and the first documented research to specifically look at the organization of the essays written by participants in the control writing group. My research study is one of the few studies to examine and analyze control essays at all.

In Frattaroli's (20) meta-analysis of 146 WED studies she found a median sample size of 60 total participants per study, 30 per group. In the first research study using the GREAT coding system, only 40 participants were included in the data analyses (32). One of Frattaroli's (20) concluding suggestions to future researchers was to power up their studies, particularly by increasing the number of participants. In the lymphedema study, participation was higher than the average reported by Frattaroli. There were 104 participants in the original lymphedema study with 52 participants assigned to the intervention group. In other words, in this dissertation study, 415 essays were coded for organization scores.

Frattaroli (20) in her meta-analysis found the psychological health subcategories of

distress, depression, subjective well-being, anger, and anxiety were shown to improve as a result of written emotional disclosure and that overall it appears that WED is helpful for psychological health outcomes that are more directly related to emotions (e.g., depression, positive functioning) than to cognitions (e.g., cognitive schemas, body image disorder). This study continued to look at some of the variables that other written emotional disclosure researchers have found to be influenced by the intervention (e.g., depression, subjective well-being, anger and distress) as well as other less-studied variables such as sex interest, insurance frustration, and physical symptoms specific to breast cancer survivors with lymphedema.

From my analyses of essays written by participants with treatment-related lymphedema secondary to breast cancer, I found that there is some modest support for the notion that an organized (i.e., coherent and cohesive) essay and/or the formation of an organized essay over a number of writing sessions correlates to improvements in reported physical and mental health symptoms and certain social behavior outcomes. In addition, because the participants who wrote using emotional disclosure instructions (i.e., the intervention group) and the participants writing about neutral topics (i.e., the control group) wrote essays with similar organization ratings, I can infer that there were group differences in the relationships between organization scores (and changes in organization scores over time) and changes in selected outcomes over time.

Based on my findings, Klest and Freyd (32) were correct in stating that scoring control essays in which participants write emotionally neutral but still potentially coherent stories could help parse out the relative contributions of emotional expression and essay organization in the health benefits of narrative writing. In this dissertation

study, asking participants to write with emotion about living with lymphedema did not prompt more organized narratives than instructions to write about neutral topics. Both the intervention and control groups wrote similarly organized essays, but overall the organization scores of the intervention group predicted better outcomes in a higher number of health and social behavior variables. So, some other variable other than essay organization seems to be moderating the outcomes.

My results suggest that the GREAT code, particularly the organization score, measures a quality of essays that has predictive power. The GREAT code is a potentially useful research tool for deepening understanding about the mechanisms underlying the health benefits of written emotional disclosure (32). The findings that better essay organization is related to positive health and social behavior outcomes suggest that narrative coherence and cohesion may play an important role in the health benefits of WED.

After conducting this research, I continue to believe that there is probably no single process that explains the findings of WED research, but rather multiple interacting factors that drive the effectiveness of this writing intervention (43, 56-57, 84). However, the formation of a coherent and cohesive narrative can be considered one of those driving factors that influence the effectiveness of WED. In other words, my research supports other researchers and theorists who believe that writers who place a cognitive structure on their experiences and build on this structure over time, communicate their ideas through language, attempt to deliver a coherent message, and structure the content to make it understandable to themselves and others probably report more health benefits from the intervention (42-43, 61, 63, 100-101, 137).

Limitations and Alternative Explanations

To test my hypotheses I relied on a tool developed in 2007 by Klest and Freyd (32), the GREAT code, which scores essay organization using sub-rubrics for coherence and cohesion. In their study using this coding system inter-rater reliability levels were uniformly high, with alphas between .84 and .93 for the coding used in data analyses. Their data analyses showed that organization scores of the emotional disclosure writers were significantly predictive of decreases in physical and mental health symptoms, and marginally associated with decreases in dissociation (32). In my study, during our GREAT code training sessions, inter-rater reliability levels ranged from 0.71 to 0.87 in the first session and 0.80 to 0.91 in the second session. However, in the actual research study, inter-rater reliabilities were statistically significant but moderately inter-related in the first three writing sessions (0.54, 0.53, and 0.57); for the final writing session the inter-rater reliability coefficient alphas were statistically significant and substantially inter-related at 0.76. This finding is potentially problematic in that conventionally the absolute minimum inter-rater reliability coefficient alpha considered reliable is 0.60 (32). One way, perhaps, of achieving more reliable ratings would be to have more than two raters, and to average across that greater number of ratings. It may also be a limitation to my study that the two raters were related (mother and daughter).

It should be noted here that prior to coding the essays in this dissertation research, a list of random numbers was established using an internet site that utilizes atmospheric noise to produce the randomness. The essays were randomized according to this generated list. The two raters independently read and coded the essays and the essays were read in the assigned random order to ensure that each essay was coded separately

and not as a continuation of a previous essay. In addition, to eliminate any practice effect, the two raters began from opposite ends of the randomized list. In the Klest and Freyd (32) study, although no essay was rated by the same person for both training and analysis, the same set of essays was used for both code development and final coding. It is possible that the high reliability coefficients resulted at least partially from this overlap (32).

When testing my second hypothesis—that participants showing a progression of narrative organization over time would experience better mental and physical health outcomes and social behavior outcomes at each follow-up point, I utilized the residualized change scores rather than simple change scores in the analyses. Specifically, organization scores from the first and second writing session were averaged for the early essay score. Organization scores from the third and fourth writing session were averaged for the late essay score. Then, late essay scores were regressed on the early essay scores to compute the standardized residual scores which, in effect, functioned as change in organization score. Regressions were performed using the residualized change in organization scores over time as predictors of changes in mental and physical health outcomes and social behavior outcomes. There is current argument among researchers as to whether using residualized change scores or simple change scores is the better approach. I recognize that using simple change scores might produce different results.

The essays coded for this study were from women who had developed chronic Stage II lymphedema subsequent to breast cancer treatment. Thus, it is possible that the findings in this study might not generalize to other populations, such as patients with other medical conditions or males.

Another limitation involved the fact that I conducted a large number of exploratory analyses examining the predictive value of organization scores to changes in numerous variables measuring physical, psychological and social behavior variables with a liberal Type I error rate. Therefore, some of my findings that I am reporting as significant could possibly be due to chance. In addition, it is important to consider that correlations provide only suggestive evidence for or against a particular causal mechanism (such as the organization of the essay). Correlation studies cannot prove that one variable causes a change in another variable. To really nail down a mechanism, the researcher must devise another experiment aimed at changing the supposed mechanism while controlling extraneous or confounding variables.

Implications for Nursing Practice

This research study provides some support for the postulate that writing an organized essay or the formation of an organized narrative over time while disclosing thoughts and feelings emotionally contributes to physical and mental health benefits. If future research replicates these findings, then nurses can incorporate written emotional disclosure intervention emphasizing the formation of a coherent narrative. Specifically, advanced practice nurses in the field of mental health could use this modality, with the writing instructions modified in ways to support more coherence, cohesion and organization in the written emotional disclosure writings of their clients. With the popularity of internet blogging (that often includes emotional writing) and the surging acceptance of narrative medicine, the time is ripe for nurses to utilize this simple technique. Written emotional disclosure has the potential to be a cost-effective, time-

efficient therapeutic intervention that empowers a patient's natural abilities for health and healing. This approach implies respect for the patient and promotes autonomy and contributes to Nightingale's meta-narrative—that the natural source of healing resides in the patient (103).

Recommendations for Future Research

Although the GREAT code appears to be a potentially reliable and valid research tool, and narrative organization (as operationalized by GREAT code ratings) appears to be somewhat related to symptom improvements, more research using the GREAT coding system is needed to continue to assess its psychometric properties. The GREAT coding system needs to be applied to essays written by diverse populations under varying circumstances. In addition, similar research studies to the one I conducted examining the correlation of essay organization and health benefits in breast cancer survivors with lymphedema should be replicated with varying populations under varying conditions.

In this study, intervention and control group writers wrote essays with similar organization ratings although the control writers were instructed to write about neutral topics. To continue to parse out the relative contributions of emotional expression and essay organization in the health benefits of written emotional disclosure, researchers need to revisit writing instructions. If writing an organized narrative is beneficial to health, perhaps providing instruction on how to do this could help people with previously less coherent and cohesive essays gain health benefits (and increase effect sizes in our research studies). Perhaps a writing course focused on developing a coherent narrative could be an effective intervention and research on such an intervention could help

determine whether the relationship between organization and positive health outcomes is a causal one (32).

Future researchers should consider intervention writing instructions that promote the formation of a coherent and cohesive narrative and perhaps consider control writing instructions that discourage essay organization. Klest and Freyd (32) suggest pitting emotional expression against essay organization to test if emotional expression is integral to receiving health benefits and to assess the possibility that the combination of these two factors are necessary for positive health outcomes. In addition, if there is indeed a significant and positive correlation between the length of the essay and its organization, researchers could utilize this finding in detailing their writing instructions. In other words, future instructions to intervention writers might include length parameters to promote writing an organized essay or alternatively controlling for essay length in the data analyses.

Researchers should also consider conducting a new set of analyses where the dependent variable is organization scores, and the predictors are personal attributes or characteristics of the writers. In other words, how do personal attributes affect essay organization? This research could possibly help us predict which individuals would write more organized essays, thus helping us determine for whom the writing intervention works best.

Appendix A

Center for Epidemiologic Studies Depression Scale (CES-D)

Below is a list of the ways you might have felt or behaved. Mark how often you have felt this way during the past week.

During the past week	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most of all of the time (5-7 days)
1. I was bothered by things that usually don't bother me.				
2. I did not feel like eating; my appetite was poor.				
3. I felt that I could not shake off the blues, even with help from my family or friends.				
4. I felt I was just as good as other people.				
5. I had trouble keeping my mind on what I was doing.				
6. I felt depressed.				
7. I felt that everything I did was an effort.				
8. I felt hopeful about the future.				
9. I thought my life had been a failure.				
10. I felt fearful.				
11. My sleep was restless.				
12. I was happy.				
13. I talked less than usual.				
14. I felt lonely.				
15. People were unfriendly.				
16. I enjoyed life.				
17. I had crying spells.				
18. I felt sad.				
19. I felt that people disliked me.				
20. I could no get "going".				

SCORING: zero for answers in the first column, 1 for answers in the second column, 2 for answer in the third column, 3 for answers in the fourth column. The scoring of positive items (4, 8, 12, and 16) is reversed. Possible range of scores is zero to 60, with the higher scores indicating the presence of more symptomatology.

Roughly speaking, the higher the overall score, the greater the depressive symptoms.

Screening test scoring ranges:

- Less than 15, you do not appear to be experiencing high levels of depressive symptoms
- 15-21, Mild to Moderate Depression
- Over 21, possibility of Major Depression

Original reference:

Radloff, L.S. (1977). The CES-D scale: A self report depression scale for research in the general population. *Applied Psychological Measurement* 1: 385-401.

Appendix B

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SYMPTOM CHECKLIST-36

For each of the symptoms below circle yes or no to indicate whether you have had this symptom DURING THE PAST WEEK.
If you circle yes, please rate how intense this symptom was using the 1 to 10 point scale.
Also rate how distressed you were by this symptom using the 1 to 10 point scale.

During the past week have you experienced in the arm on the side where you have lymphedema:

Symptom	Yes/No	Intensity	Distress
1. Heaviness in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
2. Tightness in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
3. Burning pain in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
4. Burning pain in your chest	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
5. Stabbing pain in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
6. Cramping pain in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
7. Pain in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
8. Warmth in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
9. Coldness in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
10. Numbness in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
11. Achiness in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
12. Swelling in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
13. Hardness in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe

14. Tingling in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
15. Pins and needles in your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
16. Difficulty moving arm side to side	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
17. Difficulty in raising arm above head	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
18. Flaky skin on your arm	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe

In the past week have you had feelings of:

Symptom	Yes/No	Intensity	Distress
19. Sadness	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
20. Anger	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
21. Lack of confidence in self	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
22. Lack of confidence in your insurance provider	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
23. Concerns about how you look	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
24. Being misunderstood by spouse/significant other	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
25. Being less sexually attractive	Yes No Prefer not to Answer	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
26. Frustration with your insurance company	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
27. Loss of confidence in your body	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe

In the past week have you experienced:

28. Fatigue	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
29. Difficulty sleeping	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
30. Increased appetite	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
31. Lack of interest in sex	Yes No Prefer not to Answer	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
32. Partner having lack of interest in sex	Yes No Prefer not to Answer	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe

Since developing lymphedema have you:

33. Permanently given up any hobbies or leisure activities	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
34. Consistently decreased social activities	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
35. Decreased level of physical activities.	Yes No	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe
36. Had a decrease in sexual activity	Yes No Prefer not to Answer	Slight 1 2 3 4 5 6 7 8 9 10 Severe	Slight 1 2 3 4 5 6 7 8 9 10 Severe

Appendix C

Great Coding Rubric

General instructions

Holistic scoring is based upon the reader's overall impression of the effectiveness of a piece of writing. The scoring guide defines the characteristics of effective writing and makes it possible for the reader to score the writing on objective criteria. In order to receive a particular score on a particular dimension, a piece of writing should objectively meet the criteria set by the scoring guide. It is impossible to encompass the exact content of all possible essays with one scoring guide. Frequently, an essay will not match all of the criteria for any score. In this case, it is up to the reader to determine which score most closely represents an essay. It is important to attempt not to confound one element of the essay with others when scoring using a scoring rubric. Each essay should be coded individually. It is important to look at what is actually written in an essay, and not what is implied, or what might be implied given the content of previous essays. Thus each essay is coded separately, not as a continuation of the previous essay. Two essays by the same individual about the same topic may receive very different scores based on what is actually written in each essay (32).

Example of Coding Sheet

Subject Code _____

Session 1 2 3 4

Coder _____

Organization _____

Coherence _____ Cohesion _____

Comments

Coherence. How good is the overall plan or structure of the essay? Does the story progress logically, with a beginning, middle, and conclusion? If the reader is able to determine a beginning, middle, and end to the story that is the main focus of the essay, the essay is coded a 3 or higher. If not, it is a 2 or lower.

1	2	3	4	5
Not enough was written to code this essay, or the essay is not understandable to the reader.	<p>Possible evidence of attempted structure, but structure is hard to infer.</p> <p>The story focuses on more than one event, none of which have enough detail to give the story a clear focus, or there is not much detail provided about the focus event.</p> <p>Organization is rough, though it may not be completely absent.</p>	<p>Has basics of structure, including a roughly defined beginning, middle, and end.</p> <p>Has one main focus but also includes less important events/details that do not add to the reader's understanding, or, fails to provide important details that would add to the reader's understanding</p> <p>Frequently gets off topic.</p>	<p>Has good structure, including a beginning, middle and end in logical order.</p> <p>Tells about one specific event in detail with only minor digressions.</p> <p>Once or twice includes less important details that do not add to the reader's understanding.</p>	<p>Has good structure, including a beginning, middle and end in logical order.</p> <p>Tells about one specific event in detail.</p> <p>Does not make digressions.</p>

Cohesion. How well does the essay transition sentence-to-sentence and topic-to-topic? Is the essay choppy or does it flow easily?

1	2	3	4	5
<p>Not enough was written to code this essay, or the essay is not understandable to the reader.</p>	<p>Many sentences do not flow easily one to the next.</p> <p>Transitions are usually hard to follow.</p> <p>The reader can only understand the progression of ideas by making inferences.</p> <p>Writing is generally choppy.</p>	<p>Some sentences flow easily one to the next.</p> <p>At times transitions are easy to follow, at times they are not.</p> <p>Ideas sometimes follow one another logically, and sometimes do not.</p> <p>Writing is not particularly choppy, but not particularly easy to read.</p>	<p>Many sentences flow easily one to the next.</p> <p>Most transitions are easy to follow.</p> <p>The reader may, rarely, have to make inferences to understand why one idea follows another.</p> <p>Generally easy to read.</p>	<p>Sentences flow easily one to the next, with only one or two exceptions.</p> <p>Transitions are easy to follow.</p> <p>The reader does not have to make inferences to understand the progression of ideas.</p> <p>Can be read quickly and effortlessly.</p>

Appendix D

Descriptive Statistics for Dependent Variables

<i>Variable</i>	<i>Baseline</i>	<i>1 month follow-up</i>	<i>3 month follow-up</i>	<i>6 month follow-up</i>
	<i>[n], Means (SD)</i>	<i>[n], Means (SD)</i>	<i>[n], Means (SD)</i>	<i>[n], Means (SD)</i>
CESD				
<i>Intervention</i>	<i>[51], 10.98 (7.84)</i>	<i>[47], 11.15 (10.70)</i>	<i>[50], 10.84, (9.00)</i>	<i>[48], 10.73 (8.86)</i>
<i>Control</i>	<i>[51], 12.51 (11.25)</i>	<i>[51], 15.57 (12.52)</i>	<i>[53], 15.00 (11.41)</i>	<i>[50], 15.32 (12.41)</i>
<i>Combined</i>	<i>[102], 11.75 (9.68)</i>	<i>[98], 13.45 (11.83)</i>	<i>[103], 12.98 (10.47)</i>	<i>[98], 13.07 (11.00)</i>
Arm neuro symptom intensity				
<i>Intervention</i>	<i>[50], 0.82 (0.92)</i>	<i>[50], 1.03 (1.43)</i>	<i>[50], 0.88 (1.10)</i>	<i>[49], 1.13 (1.16)</i>
<i>Control</i>	<i>[53], 1.59 (1.86)</i>	<i>[50], 1.44 (1.49)</i>	<i>[52], 1.57 (1.68)</i>	<i>[51], 1.85 (2.23)</i>
<i>Combined</i>	<i>[103], 1.22 (1.54)</i>	<i>[100], 1.23 (1.47)</i>	<i>[102], 1.23 (1.46)</i>	<i>[100], 1.50 (1.82)</i>
Arm neuro symptom distress				
<i>Intervention</i>	<i>[50], 0.70 (0.90)</i>	<i>[50], 0.87 (1.32)</i>	<i>[50], 0.85 (1.20)</i>	<i>[49], 0.89 (1.18)</i>
<i>Control</i>	<i>[53], 1.45 (1.89)</i>	<i>[50], 1.30 (1.45)</i>	<i>[52], 1.45 (1.69)</i>	<i>[51], 1.74 (2.08)</i>
<i>Combined</i>	<i>[103], 1.09 (1.54)</i>	<i>[100], 1.08 (1.40)</i>	<i>[102], 1.15 (1.49)</i>	<i>[100], 1.32 (1.75)</i>
Arm neuro symptom burden				
<i>Intervention</i>	<i>[51], 5.16 (11.12)</i>	<i>[50], 5.64 (10.61)</i>	<i>[51], 6.06 (12.56)</i>	<i>[50], 6.73 (15.28)</i>
<i>Control</i>	<i>[52], 5.35 (10.32)</i>	<i>[50], 4.81 (8.69)</i>	<i>[51], 4.32 (7.03)</i>	<i>[49], 6.34 (9.72)</i>
<i>Combined</i>	<i>[103], 5.25 (10.67)</i>	<i>[100], 5.22 (9.66)</i>	<i>[102], 5.19 (10.16)</i>	<i>[99], 6.54 (12.77)</i>
Arm/skin/movement symptom intensity				
<i>Intervention</i>	<i>[51], 0.52 (1.02)</i>	<i>[50], 0.45 (0.92)</i>	<i>[47], 0.49 (1.01)</i>	<i>[47], 0.36 (0.88)</i>
<i>Control</i>	<i>[52], 1.03 (1.64)</i>	<i>[51], 0.70 (1.27)</i>	<i>[52], 0.61 (1.25)</i>	<i>[50], 0.97 (1.60)</i>
<i>Combined</i>	<i>[103], 0.78 (1.39)</i>	<i>[101], 0.58 (1.11)</i>	<i>[99], 0.55 (1.14)</i>	<i>[97], 0.68 (1.33)</i>
Arm/skin/movement symptom distress				
<i>Intervention</i>	<i>[51], 0.44 (1.08)</i>	<i>[50], 0.42 (0.90)</i>	<i>[47], 0.46 (1.08)</i>	<i>[47], 0.31 (0.92)</i>
<i>Control</i>	<i>[52], 1.04 (1.87)</i>	<i>[51], 0.59 (1.24)</i>	<i>[52], 0.67 (1.51)</i>	<i>[50], 0.97 (1.72)</i>
<i>Combined</i>	<i>[103], 0.74 (1.55)</i>	<i>[101], 0.51 (1.08)</i>	<i>[99], 0.57 (1.32)</i>	<i>[99], 0.65 (1.42)</i>
Arm/skin/movement symptom burden				
<i>Intervention</i>	<i>[51], 3.13 (8.92)</i>	<i>[49], 2.99 (9.21)</i>	<i>[49], 2.80 (10.28)</i>	<i>[49], 3.77 (11.49)</i>
<i>Control</i>	<i>[52], 4.99 (12.12)</i>	<i>[52], 2.47 (5.97)</i>	<i>[50], 3.12 (7.24)</i>	<i>[47], 3.52 (8.84)</i>
<i>Combined</i>	<i>[103], 4.07 (10.64)</i>	<i>[101], 2.73 (7.68)</i>	<i>[99], 2.96 (8.83)</i>	<i>[96], 3.65 (10.22)</i>
Arm size symptom intensity				
<i>Intervention</i>	<i>[51], 1.96 (1.74)</i>	<i>[50], 2.11 (1.59)</i>	<i>[50], 2.08 (1.98)</i>	<i>[48], 2.41 (1.99)</i>
<i>Control</i>	<i>[52], 3.10 (2.61)</i>	<i>[51], 3.10 (2.37)</i>	<i>[53], 3.19 (2.39)</i>	<i>[51], 3.25 (2.80)</i>
<i>Combined</i>	<i>[103], 2.53 (2.28)</i>	<i>[101], 2.61 (2.08)</i>	<i>[103], 2.65 (2.26)</i>	<i>[99], 2.84 (2.47)</i>

<i>Arm size</i>				
<i>symptom distress</i>				
<i>Intervention</i>	[51], 1.65 (1.45)	[50], 1.80 (1.79)	[50], 1.72 (1.86)	[48], 1.89 (1.80)
<i>Control</i>	[52], 2.63 (2.49)	[51], 2.60 (2.28)	[53], 2.83 (2.42)	[51], 2.83 (2.87)
<i>Combined</i>	[103], 2.14 (2.09)	[101], 2.20 (2.08)	[103], 2.29 (2.23)	[99], 2.38 (2.44)
<hr/>				
<i>Arm size</i>				
<i>symptom burden</i>				
<i>Intervention</i>	[51], 13.21 (19.50)	[50], 14.85 (21.86)	[51], 15.85 (22.05)	[49], 17.59 (27.26)
<i>Control</i>	[52], 9.86 (15.41)	[51], 7.24 (6.62)	[52], 9.30 (13.08)	[49], 12.24 (15.83)
<i>Combined</i>	[103], 11.52 (17.55)	[101], 11.01 (16.45)	[103], 12.54 (18.30)	[98], 14.91 (22.34)
<hr/>				
<i>Arm pain</i>				
<i>symptom intensity</i>				
<i>Intervention</i>	[51], 0.94 (1.16)	[50], 0.84 (1.02)	[49], 0.97 (1.23)	[49], 0.94 (1.10)
<i>Control</i>	[53], 1.72 (2.05)	[51], 1.84 (2.15)	[53], 2.23 (2.19)	[51], 2.25 (2.48)
<i>Combined</i>	[104], 1.34 (1.71)	[101], 1.34 (1.75)	[102], 1.63 (1.89)	[100], 1.61 (2.03)
<hr/>				
<i>Arm pain</i>				
<i>symptom distress</i>				
<i>Intervention</i>	[51], 0.82 (1.07)	[50], 0.78 (1.19)	[49], 0.78 (1.05)	[49], 0.70 (0.84)
<i>Control</i>	[53], 1.58 (2.09)	[51], 1.60 (1.97)	[53], 1.96 (1.97)	[51], 2.11 (2.31)
<i>Combined</i>	[104], 1.21 (1.70)	[101], 1.19 (1.68)	[102], 1.39 (1.69)	[100], 1.42 (1.88)
<hr/>				
<i>Arm pain</i>				
<i>symptom burden</i>				
<i>Intervention</i>	[51], 6.09 (14.12)	[50], 7.51 (15.65)	[51], 8.10 (15.16)	[50], 9.32 (17.38)
<i>Control</i>	[53], 6.01 (10.84)	[51], 4.60 (8.03)	[51], 6.78 (9.48)	[49], 7.27 (11.35)
<i>Combined</i>	[104], 6.05 (12.50)	[101], 6.04 (12.43)	[102], 7.44 (12.60)	[99], 8.31 (14.67)
<hr/>				
<i>Psych</i>				
<i>symptom intensity</i>				
<i>Intervention</i>	[50], 1.24 (1.43)	[46], 1.45 (1.74)	[48], 1.27 (1.54)	[45], 1.28 (1.70)
<i>Control</i>	[50], 2.30 (2.28)	[48], 2.37 (2.18)	[49], 2.43 (2.40)	[46], 2.25 (2.28)
<i>Combined</i>	[100], 1.77 (1.97)	[94], 1.92 (2.02)	[97], 1.86 (2.09)	[91], 1.77 (2.06)
<hr/>				
<i>Psych</i>				
<i>symptom distress</i>				
<i>Intervention</i>	[50], 1.16 (1.46)	[46], 1.50 (1.94)	[48], 1.20 (1.49)	[45], 1.25 (1.69)
<i>Control</i>	[50], 2.34 (2.39)	[48], 2.35 (2.32)	[49], 2.49 (2.52)	[46], 2.20 (2.38)
<i>Combined</i>	[100], 1.75 (2.06)	[94], 1.93 (2.18)	[97], 1.85 (2.17)	[91], 1.73 (2.11)
<hr/>				
<i>Psych</i>				
<i>symptom burden</i>				
<i>Intervention</i>	[51], 13.14 (18.51)	[47], 13.61 (16.96)	[48], 14.15 (19.41)	[46], 11.28 (17.25)
<i>Control</i>	[49], 8.20 (14.01)	[47], 10.34 (17.28)	[49], 8.74 (14.38)	[44], 10.61 (17.35)
<i>Combined</i>	[100], 10.72 (16.56)	[94], 11.98 (17.11)	[97], 11.42 (17.18)	[90], 10.95 (17.20)
<hr/>				
<i>Sex interest</i>				
<i>symptom intensity</i>				
<i>Intervention</i>	[40], 1.95 (2.40)	[39], 1.92 (2.44)	[39], 1.79 (2.34)	[35], 1.75 (2.28)
<i>Control</i>	[41], 3.28 (3.36)	[42], 3.56 (3.47)	[42], 3.33 (3.51)	[38], 3.47 (3.45)
<i>Combined</i>	[81], 2.63 (2.98)	[81], 2.77 (3.11)	[81], 2.59 (3.09)	[73], 2.65 (3.05)

<i>Sex interest symptom distress</i>				
<i>Intervention</i>	[40], 1.71 (2.23)	[39], 1.57 (2.17)	[39], 1.42 (2.06)	[35], 1.44 (2.07)
<i>Control</i>	[41], 2.95 (3.29)	[42], 2.71 (3.14)	[42], 2.92 (3.42)	[38], 2.80 (3.15)
<i>Combined</i>	[81], 2.34 (2.87)	[81], 2.16 (2.76)	[81], 2.20 (2.93)	[73], 2.15 (2.76)
<i>Sex interest symptom burden</i>				
<i>Intervention</i>	[38], 2.64 (3.20)	[41], 2.46 (3.01)	[38], 2.36 (3.01)	[36], 2.48 (2.87)
<i>Control</i>	[43], 2.07 (2.54)	[40], 1.85 (2.48)	[43], 2.05 (2.89)	[36], 1.87 (2.66)
<i>Combined</i>	[81], 2.34 (2.87)	[81], 2.16 (2.76)	[81], 2.20 (2.93)	[72], 2.18 (2.76)
<i>Insurance stress symptom intensity</i>				
<i>Intervention</i>	[51], 1.14 (2.36)	[50], 1.03 (2.34)	[50], 0.69 (1.44)	[49], 0.97 (2.46)
<i>Control</i>	[53], 1.44 (2.94)	[50], 1.46 (2.80)	[53], 1.52 (2.84)	[50], 1.31 (2.68)
<i>Combined</i>	[104], 1.29 (2.67)	[100], 1.25 (2.58)	[103], 1.12 (2.30)	[99], 1.14 (2.57)
<i>Insurance stress symptom distress</i>				
<i>Intervention</i>	[51], 0.95 (2.07)	[50], 1.07 (2.40)	[50], 0.68 (1.41)	[49], 0.88 (2.18)
<i>Control</i>	[53], 1.40 (2.86)	[50], 1.47 (2.86)	[53], 1.55 (2.89)	[50], 1.26 (2.71)
<i>Combined</i>	[104], 1.18 (2.51)	[100], 1.27 (2.63)	[103], 1.13 (2.32)	[99], 1.07 (2.46)
<i>Insurance stress symptom burden</i>				
<i>Intervention</i>	[51], 9.04 (22.01)	[50], 9.69 (20.85)	[51], 8.85 (19.53)	[50], 8.21 (19.62)
<i>Control</i>	[53], 7.44 (20.77)	[50], 7.17 (20.60)	[52], 4.73 (14.57)	[48], 7.26 (24.53)
<i>Combined</i>	[104], 8.23 (21.30)	[100], 8.43 (20.66)	[103], 6.77 (17.24)	[98], 7.74 (22.05)
<i>Systemic symptom intensity</i>				
<i>Intervention</i>	[51], 1.45 (1.17)	[49], 1.45 (1.18)	[50], 1.76 (1.35)	[49], 1.62 (1.50)
<i>Control</i>	[53], 2.29 (1.79)	[52], 2.25 (1.83)	[53], 2.44 (1.95)	[49], 2.16 (1.61)
<i>Combined</i>	[104], 1.88 (1.57)	[101], 1.86 (1.59)	[103], 2.11 (1.71)	[98], 1.89 (1.57)
<i>Systemic symptom distress</i>				
<i>Intervention</i>	[51], 1.31 (1.22)	[49], 1.31 (1.33)	[50], 1.51 (1.32)	[49], 1.51 (1.48)
<i>Control</i>	[53], 2.05 (1.90)	[52], 2.01 (1.98)	[53], 2.28 (2.06)	[49], 1.97 (1.60)
<i>Combined</i>	[104], 1.69 (1.64)	[101], 1.67 (1.72)	[103], 1.91 (1.78)	[98], 1.74 (1.55)
<i>Systemic symptom burden</i>				
<i>Intervention</i>	[51], 9.39 (13.22)	[50], 9.91 (13.24)	[51], 11.75 (15.97)	[50], 10.01 (13.89)
<i>Control</i>	[53], 10.08 (13.11)	[51], 9.15 (12.98)	[52], 10.96 (12.16)	[47], 10.29 (12.89)
<i>Combined</i>	[104], 9.74 (13.10)	[101], 9.53 (13.05)	[103], 11.35 (14.11)	[97], 10.15 (13.35)
<i>Overall symptom intensity</i>				
<i>Intervention</i>	[51], 1.23 (0.91)	[49], 1.27 (0.94)	[50], 1.25 (1.05)	[49], 1.27 (1.05)
<i>Control</i>	[52], 2.09 (1.64)	[50], 2.09 (1.61)	[53], 2.20 (1.69)	[49], 2.17 (1.81)
<i>Combined</i>	[103], 1.66 (1.39)	[99], 1.69 (1.38)	[103], 1.74 (1.49)	[98], 1.72 (1.54)

<i>Overall symptom Distress</i>				
<i>Intervention</i>	[51], 1.09 (0.93)	[49], 1.19 (1.12)	[50], 1.11 (1.08)	[49], 1.09 (1.02)
<i>Control</i>	[52], 1.96 (1.73)	[50], 1.89 (1.68)	[53], 2.08 (1.79)	[49], 2.00 (1.85)
<i>Combined</i>	[103], 1.53 (1.45)	[99], 1.54 (1.46)	[103], 1.61 (1.56)	[98], 1.55 (1.55)
<i>Overall symptom burden</i>				
<i>Intervention</i>	[51], 9.77 (12.70)	[50], 10.29 (12.72)	[51], 11.01 (14.55)	[50], 10.09 (14.34)
<i>Control</i>	[52], 8.22 (10.11)	[49], 7.72 (10.20)	[52], 8.17 (9.69)	[47], 8.82 (11.19)
<i>Combined</i>	[103], 8.99 (11.44)	[99], 9.02 (11.56)	[103], 9.58 (12.36)	[97], 9.47 (12.86)
<i>LSIDS total number symptoms reported</i>				
<i>Intervention</i>	[51], 14.10 (8.08)	[50], 14.06 (7.24)	[51], 14.57 (8.16)	[50], 14.42 (8.00)
<i>Control</i>	[53], 14.11 (6.35)	[51], 13.59 (6.54)	[52], 13.50 (6.52)	[48], 14.88 (7.12)
<i>Combined</i>	[104], 14.11 (7.22)	[101], 13.82 (6.86)	[103], 14.03 (7.36)	[98], 14.64 (7.54)

REFERENCES

- (1) Alford, W. K., Malouff, J. M., & Osland, K. S. (2005). Written emotional expression as a coping method in child protective services officers. *International Journal of Stress Management, 12*(2), 177-187.
- (2) Alpers, G. W., Winzelberg, C. C., Roberts, H., Dev, P., Koopman, C., & Taylor, C.B. (2005). Evaluation of computerized text analysis in an internet breast cancer support group. *Computers in Human Behavior, 21*, 343-358.
- (3) Ames, S. C., Patten, C. A., Offord, K. P., Pennebaker, J. W., Croghan, I. T., Tri, D. M., et al. (2005). Expressive writing intervention for young adult cigarette smokers. *Journal of Clinical Psychology, 61*(12), 1555-1570.
- (116) Atkinson, R., Hare, T., Merriman, M., & Vogel, A. (2009). Therapeutic benefits of expressive writing in an electronic format. *Nursing Administration Quarterly, 33*(3), 212-215.
- (4) Austenfeld, J. L., & Stanton, A. L. (2008). Writing about emotions versus goals: Effects on hostility and medical care utilization moderated by emotional approach coping processes. *British Journal of Health Psychology, 13*, 35-39.
- (5) Baikie, K. A. (2008). Who does expressive writing work for? Examination of alexithymia, splitting, and repressive coping style as moderators of the expressive writing paradigm. *British Journal of Health Psychology, 13*, 61-66.
- (123) Bantum, E.O., & Owen, J. E. (2009). Evaluating the validity of computerized content analysis programs for identification of emotional expression in cancer narratives. *Psychological Assessment, 21*(1), 79-88.
- (122) Barclay, L. J. & Skarlicki, D. P. (2009). Healing the wounds of organizational injustice: Examining the benefits of expressive writing. *Journal of Applied Psychology, 94*(2), 511-523.
- (102) Barrett, E. A. M. (2004). What is nursing science? In P.G. Reed, N. C. Shearer, & L. H. Nicoll (Eds.), *Perspectives on nursing theory* (4th ed.) (pp. 627-640). Philadelphia: Lippincott Williams & Wilkins.
- (124) Bhuvaneshwar, C., Stern, T., & Beresin, E. (2009). Using the Technique of Journal Writing to Learn Emergency Psychiatry. *Academic Psychiatry, 33*, 43-46

- (101) Booth, R. J., & Petrie, K. J. (2002). Emotional expression and health changes: Can we identify biological pathways? In S.J. Lepore & J.M. Smyth (Eds.), *The writing cure: How expressive writing promotes health and emotional well-being* (pp. 157-175). Washington, DC: American Psychological Association.
- (6) Broderick, J. E., Junghaenel, D. U., & Schwartz, J. E. (2005). Written emotional expression produces health benefits in fibromyalgia patients. *Psychosomatic medicine*, *67*(2), 326-334.
- (7) Broderick, J. E., Stone, A. A., Smyth, J. M., & Kaell, A. T. (2004). The feasibility and effectiveness of an expressive writing intervention for rheumatoid arthritis via home-based videotaped instructions. *Annals of Behavioral Medicine*, *27*(1), 50-59.
- (8) Brody, L. R., & Park, S. H. (2004). Narratives, mindfulness, and the implicit audience. *Clinical Psychology: Science and Practice*, *11*(2), 147-154.
- (133) Bugg, A., Turpin, G., Mason, S., & Scholes, C. (2009). A randomised controlled trial of the effectiveness of writing as a self-help intervention for traumatic injury patients at risk of developing post-traumatic stress disorder. *Behaviour Research and Therapy*, *47*, 6-12.
- (9) Burton, C. M., & King, L. A. (2008). Effects of (very) brief writing on health: The two-minute miracle. *British Journal of Health Psychology*, *13*, 9-14.
- (135) Cepeda, M. S., Chapman, C. R., Miranda, N., Sanchez, R., Rodriguez, C. H., Restrepo, A. E., et al. (2008). Emotional disclosure through patient narrative may improve pain and well-being: Results of a randomized controlled trial in patients with cancer pain. *Journal of Pain and Symptom Management*, *35*(6), 623-631.
- (10) Charon, R. (2008). *Narrative medicine*. Retrieved June 12, 2008, from LitSite Alaska Web site: <http://litsite.alaska.edu/healing/medicine.html>
- (139) Charon, R. Retrieved August 2, 2009, from Web site: http://www.nlm.nih.gov/changingthefaceofmedicine/video/58_1_trans.html
- (11) Chung, C. K., & Pennebaker, J. W. (2008). Variations in the spacing of expressive writing sessions. *British Journal of Health Psychology*, *13*, 15-21.
- (107) Cogmed America, Inc. *About working memory*. Retrieved May 17, 2009, from <http://www.aboutworkingmemory.com/>

- (12) Cohen, J. L., Sander, L. M., Slavin, O. M., & Lumley, M. A. (2008). Different methods of single-session disclosure: What works for whom? *British Journal of Health Psychology, 13*, 15-21.
- (13) Corter, A. L., & Petrie, K. J. (2008). Expressive writing in context: The effects of a confessional setting and delivery of instructions on participant experience and language in writing. *British Journal of Health Psychology, 13*, 27-30.
- (14) DasGupta, S. & Charon, R. (2004). Personal illness narratives: Using reflective writing to teach empathy. *Academic Medicine, 79*(4), 351-356.
- (15) Dellasega, C. A. (2001). Using structured writing experiences to promote mental health. *Journal of Psychosocial Nursing and Mental Health Services, 39*(2), 14-23.
- (16) de Moor, C., Sterner, J., Hall, M., Warneke, C., Gilani, Z., Amato, R., et al. (2002). A pilot study of the effects of expressive writing on psychological and behavioral adjustment in patients enrolled in a phase II trial of vaccine therapy for metastatic renal cell carcinoma. *Health Psychology, 21*(6), 615-619.
- (142) D'Souza, P.J., Lumley, M. A., Kraft, C. A., & Dooley, J. A. (2008). Relaxation training and written emotional disclosure for tension or migraine headaches: A randomized, controlled trial. *Annals of Behavioral Medicine, 36*(1), 21–32.
- (17) Epstein, E. M., Sloan, D. M., & Marx, B. P. (2005). Getting to the heart of the matter: Written disclosure, gender, and heart rate. *Psychosomatic Medicine, 67*(3), 413-419.
- (18) Fernandez, I., & Paez, D. (2008). The benefits of expressive writing after the Madrid terrorist attack: Implications for emotional activation and positive affect. *British Journal of Health Psychology, 13*, 31-34.
- (19) Fivush, R., Edwards, V. J., & Mennuti-Washburn, J. (2003). Narratives of 9/11: Relations among personal involvement, narrative content and memory of the emotional impact over time. *Applied Cognitive Psychology, 17*, 1099-1111.
- (129) Fraas, M., & Balz, M. A. (2008). Expressive electronic journal writing: Freedom of communication for survivors of acquired brain injury. *Journal of Psycholinguist Research, 37*, 115–124.
- (20) Frattaroli, J. (2006). Experimental disclosure and its moderators: A meta-analysis. *Psychological Bulletin, 132*(6), 823-865.
- (21) Frisina, P. G., Borod, J. C., & Lepore, S. J. (2004). A meta-analysis of the effects of written emotional disclosure on the health outcomes of clinical populations. *The Journal of Nervous and Mental Disease, 192*(9), 629-634.

- (22) Frisina, P. G., Lepore, S. J., & Borod, J. C. (2005). Written emotional disclosure and clinical populations: Confirming and updating our meta-analytic findings. *The Journal of Nervous and Mental Disease, 193*(6), 425-426.
- (23) Gidron, Y., Duncan, E., Lazar, A., Biderman, A., Tandeter, H., & Shvartzman, P. (2002). Effects of guided written disclosure of stressful experiences on clinic visits and symptoms in frequent clinic attenders. *Family Practice, 19*, 161-166.
- (24) Gillis, M. E., Lumley, M. A., Mosely-Williams, A., Leisen, J. C. C., & Roehrs, T. (2006). The health effects of at-home written emotional disclosure in fibromyalgia: A randomized trial. *Annals of Behavioral Medicine, 32*(2), 135-146.
- (112) Gould, D. (2002). Using replication studies to enhance nursing research. *Nursing Standard, 16*(49), 33-36.
- (127) Han, J. Y., Shaw, B. R., Hawkins, R. P., Pingree, S., Mctavish, F., & Gustafson, D. H. (2008). Expressing positive emotions within online support groups by women with breast cancer. *Journal of Health Psychology, 13*(8), 1002-1007.
- (25) Harris, A. H. S. (2006). Does expressive writing reduce health care utilization? A meta-analysis of randomized trials. *Journal of Consulting and Clinical Psychology, 74*(2), 243-252.
- (26) Harris, A. H. S., Thoresen, C. E., Humphreys, & K., Faul, J. (2005). Does writing affect asthma? A randomized trial. *Psychosomatic Medicine, 67*(1), 130-136.
- (131) Hartke, R. J., King, R. B., & Denby, F. (2007). The use of writing groups to facilitate adaptation after stroke. *Topics in Stroke Rehabilitation, 26*(12).
- (109) Holzemer, W. L., Henry, S. B., Nokes, K. M., Corless, I. G., Brown, M., Powell-Cope, G. M., et al. (1999). Validation of the sign & symptom check-list for persons with HIV disease (SSC-HIV). *Journal of Advanced Nursing, 30*, 1041-1049.
- (110) Holzemer, W. L., Hudson, A., Kirksey, K. M., Hamilton, M. J., & Bakken, S. (2001). The revised Sign and Symptom Check-List for HIV (SSC-HIVrev). *Journal of the Association of Nurses in AIDS Care, 12*(5), 60-70.
- (27) Junghaenel, D. U., Schwartz, J. E., & Broderick, J. E. (2008). Differential efficacy of written emotional disclosure for subgroups of fibromyalgia patients. *British Journal of Health Psychology, 13*, 57-60.
- (28) Kaufman, J. C., & Sexton, J. D. (2006). Why doesn't the writing cure help poets? *Review of General Psychology, 10*(3), 268-282.

- (134) Keefe, F. J., Anderson, T., Lumley, M., Caldwell, D., Stainbrook, D., Mckee, D., et al. (2008). A randomized, controlled trial of emotional disclosure in rheumatoid arthritis: Can clinician assistance enhance the effects? *Pain*, *137*, 164–172.
- (120) Kerner, E. A. & Fitzpatrick, M. R. (2007). Integrating writing into psychotherapy practice: A matrix of change processes and structural dimensions. *Psychotherapy: Theory, Research, Practice, Training*, *44*(3), 333-346.
- (119) Kim, H. S. (2008). Culture and the cognitive and neuroendocrine responses to speech. *Journal of Personality and Social Psychology*, *94*(1), 32-47.
- (29) Kim, Y. (2008). Effects of expressive writing among bilinguals: Exploring psychological well-being and social behavior. *British Journal of Health Psychology*, *13*, 43-47.
- (30) King, C. A. (2004). A promising psychosocial intervention: Next steps include systematic study and creative extension. *Clinical Psychology: Science and Practice*, *11*(2), 143-154.
- (100) Klein, K. (2002). Stress, expressive writing, and working memory. In S.J. Lepore & J.M. Smyth (Eds.), *The writing cure: How expressive writing promotes health and emotional well-being* (pp. 135-155). Washington, DC: American Psychological Association.
- (31) Klein, K. & Boals, A. (2001). Expressive writing can increase working memory capacity. *Journal of Experimental Psychology*, *130*(3), 520-533.
- (32) Klest, B. & Freyd, J. J. (2007). Global ratings of essays about trauma: Development of the GREAT code, and correlations with physical and mental health outcomes. *Journal of Psychological Trauma*, *6*(1), 1-20.
- (33) Koopman, C., Ismailji, T., Holmes, D., Classen, C. C., Palesh, O., & Wales, T. (2005). The effects of expressive writing on pain, depression and posttraumatic stress disorder symptoms in survivors of intimate partner violence. *Journal of Health Psychology*, *10*(2), 211-221.
- (34) Kraft, C. A., Lumley, M. A., D'Souza, P. J., & Dooley, J. A. (2008). Emotional approach coping and self-efficacy moderate the effects of written emotional disclosure and relaxation training for people with migraine headaches. *British Journal of Health Psychology*, *13*, 67-71.
- (118) Kuiken, D., Dunn, S., & LoVerso, T. (2008). Expressive writing about dreams that follow trauma and loss. *Dreaming*, *18*(2), 77-93.

- (35) Langens, T. A., & Schuler, J. (2007). Effects of written emotional expression: The role of positive expectancies. *Health Psychology, 26*(2), 174-182.
- (36) Lepore, S. J., Greenberg, M. A., Bruno, M., & Smyth, J. M. (2002). Expressive writing and health: Self-regulation of emotion-related experience, physiology, and behavior. In S.J. Lepore & J.M. Smyth (Eds.), *The writing cure: How expressive writing promotes health and emotional well-being* (pp.99-117). Washington, DC: American Psychological Association.
- (37) Lewis, R. J., Derlega, V. J., Clarke, E. G., Kuang, J. C., Jacobs, A. M., & McElligott, M. D. (2005). An expressive writing intervention to cope with lesbian-related stress: the moderating effects of openness about sexual orientation. *Psychology of Women Quarterly, 29*, 149-157.
- (38) Liehr, P., Takahashi, R., Nishimura, C., Frazier, L., Kuwajima, I., & Pennebaker, J. W. (2002). Expressing health experience through embodied language. *Journal of Nursing Scholarship, 34*(1), 27-32.
- (39) Low, C. A., Stanton, A. L., & Danoff-Burg, S. (2006). Expressive disclosure and benefit finding among breast cancer patients: Mechanisms for positive health effects. *Health Psychology, 25*(2), 181-189.
- (143) Lu, Q. , Zheng, D., Young, L., Kagawa-Singer, M., Loh, A. (2012). A pilot study of expressive writing intervention among Chinese-speaking breast cancer survivors [Abstract]. *Health Psychology*, January 9, 2012.
- (40) Lumley, M. A. (2004). Alexithymia, emotional disclosure, and health: A program of research. *Journal of Personality, 72*(6), 1271-1300.
- (41) Lumley, M. A., & Provenzano, K. M. (2003). Stress management through written emotional disclosure improves academic performance among college students with physical symptoms. *Journal of Educational Psychology, 95*(3), 641-649.
- (42) Lutgendorf, S. K. & Antoni, M. H. (1999). Emotional and cognitive processing in a trauma disclosure paradigm. *Cognitive Therapy and Research, 23*(4), 423-440.
- (43) Lutgendorf, S. K. & Ullrich, P. (2002). Cognitive processing, disclosure, and health: Psychological and physiological mechanisms. In S.J. Lepore & J.M. Smyth (Eds.), *The writing cure: How expressive writing promotes health and emotional well-being* (pp. 177-196). Washington, DC: American Psychological Association.
- (44) Lyubomirsky, S., Sousa, L., & Dickerhoof, R. (2006). The costs and benefits of writing, talking, and thinking about life's triumphs and defeats. *Journal of Personality and Social Psychology, 90*(4), 692-708.

- (45) Mackenzie, C. S., Wiprzycka, U. J., Hasher, L., & Goldstein, D. (2008). Seeing the glass half full: Optimistic expressive writing improves mental health among chronically stressed caregivers. *British Journal of Health Psychology, 13*, 73-76.
- (121) Magai, C., Consedine, N. S., Fiori, K. L., & King, A. R. (2008). Sharing the good, sharing the bad: The benefits of emotional self-disclosure among middle-aged and older adults. *Journal of Aging and Health, 21*(2), 286-313.
- (46) Marshall, C. & Rossman, G. B. (1999). *Designing qualitative research* (3rd ed.). Thousand Oaks: Sage Publications.
- (130) McCarthy, B., O'Donovan, M., & Twomey, A. (2008). Person-centred communication: Design, implementation and evaluation of a communication skills module for undergraduate nursing students—an Irish context. *Contemporary Nurse, 27*(2), 207-222.
- (47) McCullough, M. E., Root, L. M., Cohen, A. D., Helgeson, V., & Park, C. (2006). Writing about the benefits of an interpersonal transgression facilitates forgiveness. *Journal of Consulting and Clinical Psychology, 74*(5), 887-897.
- (48) McGuire, K. M. B., Greenberg, M. A., & Gevirtz, R. (2005). Autonomic effects of expressive writing in individuals with elevated blood pressure. *Journal of Health Psychology, 10*(2), 197-209.
- (49) Messias, D. K. H. (1997). *Narratives of transnational migration, work, and health: the lived experiences of Brazilian women in the United State* (Doctoral dissertation, University of California, San Francisco, 1997).
- (50) Messias, D. K. H. & DeJoseph, J. F. (2004). Feminist narrative interpretations: Challenges, tensions and opportunities for nurse researchers. *Aquichan, 4*(4), 40-49.
- (136) Mishler, E. G. (1986). *Research interviewing: Context and narrative*. Cambridge: Harvard University Press.
- (132) Mosher, C. E., & Danoff-Burg, S. (2006). Health effects of expressive letter writing. *Journal of Social and Clinical Psychology, 25*(10), 1122-1139.
- (126) Murray, M. (2009). Health psychology and writing: An introduction. *Journal of Health Psychology, 14*(2), 158-160.
- (125) Nicholls, S. (2009). Beyond expressive writing: Evolving models of developmental creative writing. *Journal of Health Psychology, 14*(2), 171-180.

- (51) Norman, S. A., Lumley, M. A., Dooley, J. A., & Diamond, M. P. (2004). For whom does it work? Moderators of the effects of written emotional disclosures in a randomized trial among women with chronic pelvic pain. *Psychosomatic Medicine*, *66*(2), 174-183.
- (52) O'Cleirigh, C., Ironson, G., Fletcher, M. A., & Schneiderman, N. (2008). Written emotional disclosure and processing of trauma are associated with protected health status and immunity in people living with HIV/AIDS. *British Journal of Health Psychology*, *13*, 81-84.
- (53) Paez, D., Velasco, C., & Gonzalez, J. L. (1999). Expressive writing and the role of alexythymia as a dispositional deficit in self-disclosure and psychological health. *Journal of Personality and Social Psychology*, *77*(3), 630-641.
- (54) Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks: Sage Publications.
- (55) Pennebaker, J. W. (1990). *Opening up: The healing power of expressing emotions*. New York: The Guilford Press.
- (56) Pennebaker, J. W. (2002). Writing, social processes, and psychotherapy: From past to future. In S.J. Lepore & J.M. Smyth (Eds.), *The writing cure: How expressive writing promotes health and emotional well-being* (pp.281-291). Washington, DC: American Psychological Association.
- (57) Pennebaker, J. W. (2004). Theories, therapies, and taxpayers: On the complexities of the expressive writing paradigm. *Clinical Psychology: Science and Practice*, *11*(2), 138-142.
- (58) Pennebaker, J. W., & Beall, S. K. (1986). Confronting a traumatic event: Toward an understanding of inhibition and disease. *Journal of Abnormal Psychology*, *95*(3), 274-281.
- (114) Pennebaker, J. W., Chung, C. K., Ireland, M., Gonzales, A., & Booth, R. J. (2007). *LIWC 2007 manual*. Austin, Texas: LIWC.net. Retrieved July 25, 2009 from <http://www.liwc.net/LIWC2007LanguageManual.pdf>
- (140) Pennebaker, J. W., & Francis, M. E. (1996). Cognitive, emotional and language processes in disclosure. *Cognition and Emotion*, *10*, 621-626.
- (59) Pennebaker, J. W., & Keough, K. A. (1999). Revealing, organizing, and reorganizing the self in response to stress and emotion. In R. J. Contrada, & R. D. Ashmore (Eds.), *Self, social identity, and physical health: Interdisciplinary explorations* (pp. 101-121). Oxford: Oxford University Press.

- (60) Pennebaker, J. W., & King, L. A. (1999). Linguistic styles: Language use as an individual difference. *Journal of Personality and Social Psychology*, 77(6), 1296-1312.
- (61) Pennebaker, J. W., Mayne, T. J., & Francis, M. E. (1997). Linguistic predictors of adaptive bereavement. *Journal of Personality and Social Psychology*, 72(4), 863-871.
- (62) Pennebaker, J. W., Mehl, M. R., & Niederhoffer, K. G. (2003). Psychological aspects of natural language use: Our words, our selves. *Annual Review of Psychology*, 54, 547-577.
- (63) Pennebaker, J. W., & Stone, L. D. (2003). Words of wisdom: Language use over the life span. *Journal of Personality and Social Psychology*, 85(2), 291-301.
- (64) Petrie, K. J., Fontanilla, I., Thomas, M. G., Booth, R. J., & Pennebaker, J. W. (2004). Effect of written emotional expression on immune function in patients with human immunodeficiency virus infection: A randomized trial. *Psychosomatic Medicine*, 66(2), 272-275.
- (108) Polit, D. F., & Hungler, B. P. (1999). *Nursing research: Principles and methods* (6th ed). Philadelphia: Lippincott.
- (65) Polkinghorne, D. E. (1988). *Narrative knowing and the human sciences*. Albany, NY: State University of New York Press.
- (66) Priest, H., Roberts, P., & Woods, L. (2002). An overview of three different approaches to the interpretation of qualitative data. *Nurse Researcher*, 10(1), 30-51.
- (67) Quartana, P. J., Schmaus, B. J., & Zakowski, S. G. (2005). Gender, neuroticism, and emotional expressivity: Effects on spousal constraints among individuals with cancer. *Journal of Consulting and Clinical Psychology*, 73(4), 769-776.
- (68) Radcliffe, A. M., Lumley, M. A., Kendall, J., Stevenson, J. K., & Beltram, J. (2007). Written emotional disclosure: Testing whether social disclosure matters. *Journal of Social and Clinical Psychology*, 26(3), 362-384.
- (141) Radcliffe, A. M., Stevenson, J. K., Lumley, M. A., D'Souza, P., & Kraft, C. (2010). Does written emotional disclosure about stress improve college students' academic performance? Results from three randomized, controlled studies. *Journal of College Student Retention*, 12(4), 407-428.
- (106) Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.

- (137) Ramírez-Esparza, N., & Pennebaker, J. W. (2006). Do good stories produce good health? Exploring words, language, and culture. *Narrative Inquiry, 16* (1), 211–219.
- (103) Reed, P. G. (2004). A treatise on nursing knowledge development for the 21st century: beyond postmodernism. In P.G. Reed, N. C. Shearer, & L. H. Nicoll (Eds.), *Perspectives on nursing theory* (4th ed.) (pp. 561-572). Philadelphia: Lippincott Williams & Wilkins.
- (69) Riessman, C. K. (1993). *Narrative analysis*. Newbury Park: International Educational and Professional Publisher.
- (70) Riley, T. & Hawe, P. (2005). Researching practice: The methodological case for narrative inquiry. *Health Education Research, 20*(2), 226-236.
- (71) Rivkin, I. D., Gustafson, J., Weingarten, I., & Chin, D. (2006). The effects of expressive writing on adjustment to HIV. *AIDS and Behavior, 10*(1), 13-26.
- (128) Romero, C. (2008). Writing wrongs: Promoting forgiveness through expressive writing. *Journal of Social and Personal Relationships, 25*, 625-643.
- (111) Schafer, W. D. (2001). Replication: a design principle for field research. *Practical Assessment, Research & Evaluation, 7*(15). Retrieved May 31, 2009 from <http://PAREonline.net/getvn.asp?v=7&n=15>
- (72) Schwartz, L. & Drotar, D. (2004). Linguistic analysis of written narratives of caregivers of children and adolescents with chronic illness: Cognitive and emotional processes and physical and psychological health outcomes. *Journal of Clinical Psychology in Medical Settings, 11*(4), 291-301.
- (73) Seih, Y. T., Lin, Y. C., Huang, C. L., Peng, C. W., & Huang, S. P. (2008). The benefits of psychological displacement in diary writing when using different pronouns. *The British Journal of Health Psychology, 13*, 39-41.
- (74) Seudfeld, P. & Pennebaker, J. W. (1997). Health outcomes and cognitive aspects of recalled negative life events. *Psychosomatic Medicine, 59*(2), 172-177.
- (75) Sheese, B. E., Brown, E. L., & Graziano, W. G. (2004). Emotional expression in cyberspace: Searching for moderators of the Pennebaker disclosure effect via e-mail. *Health Psychology, 23*(5), 457-464.
- (76) Slatcher, R. B., & Pennebaker, J. W. (2006). How do I love thee? Let me counts the words: The social effects of expressive writing. *Psychological Science, 17*(8), 660-664.

- (77) Sloan, D. M., & Marx, B. P. (2004). A closer examination of the structured written disclosure procedure. *Journal of Consulting and Clinical Psychology, 72*(2), 165-175.
- (78) Sloan, D. M. & Marx, B. P. (2004). Taking pen to hand: Evaluating theories underlying the written disclosure paradigm. *Clinical Psychology: Science and Practice, 11*(2), 121-137.
- (79) Sloan, D. M., Marx, B. P., & Epstein, E. M. (2005). Further examination of the exposure model underlying the efficacy of written emotional disclosure. *Journal of Consulting and Clinical Psychology, 73*(3), 549-554.
- (115) Sloan, D. M., Marx, B. P., Epstein, E. M., & Dobb, J. L. (2008). Expressive writing buffers against maladaptive rumination. *Emotion, 8*(2), 302-306.
- (80) Sloan, D. M., Marx, B. P., Epstein, E. M., & Lexington, J. (2007). Does altering the writing instructions influence outcome associated with written disclosure? *Behavior Therapy, 38*(2), 155-168.
- (117) Smyth, J. M. & Arigo, D. (2009). Recent evidence supports emotion-regulation interventions for improving health in at-risk and clinical populations. *Current Opinion in Psychiatry, 22*, 205-210.
- (81) Smyth, J. & Helm, R. (2003). Focused expressive writing as self-help for stress and trauma. *Journal of Clinical Psychology/In Session, 59*(2), 227-235.
- (82) Smyth, J. M., Hockemeyer, J. R., & Tulloch, H. (2008). Expressive writing and post-traumatic stress disorder: Effects on trauma symptoms, mood states, and cortisol reactivity. *British Journal of Health Psychology, 13*, 85-93.
- (83) Smyth, J. M. & Pennebaker, J. W. (2001). What are the health effects of disclosure? In A. Baum & T. A. Revenson & J. E. Singer (Eds.), *Handbook of health psychology* (pp. 339-348). London: Lawrence Erlbaum Associates.
- (84) Smyth, J. M., & Pennebaker, J. W. (2008). Exploring the boundary conditions of expressive writing: In search of the right recipe. *British Journal of Health Psychology, 13*, 1-7.
- (85) Smyth, J., True, N., & Souto, J. (2001). Effects of writing about traumatic experiences: The necessity for narrative structure. *Journal of Social and Clinical Psychology, 20*(2), 161-172.
- (86) Solano, C. L. (2007). Differential health effects of written processing of the experiences of a surgical operation in high and low risk conditions. *Journal of Clinical Psychology, 63*(4), 357-369.

- (87) Soliday, E., Garofalo, J. P., & Rogers, D. (2004). Expressive writing intervention for adolescents' somatic symptoms and mood. *Journal of Clinical and Adolescent Psychology, 33*(4), 792-801.
- (88) Stanton, A. L., & Danoff-Burg. (2002). Emotional expression, expressive writing, and cancer. In S.J. Lepore & J.M. Smyth (Eds.), *The writing cure: How expressive writing promotes health and emotional well-being* (pp. 31-51). Washington, DC: American Psychological Association.
- (89) Stanton, A. L., Danoff-Burg, S., Sworowski, L. A., Collins, C. A., Branstetter, A. D., Rodriguez-Hanley, et al., (2002). Randomized, controlled trial of written emotional expression and benefit finding in breast cancer patients. *Journal of Clinical Oncology, 20*(20), 4160-4168.
- (90) Stirman, S. W. & Penedaker, J. W. (2001). Word use in the poetry of suicidal and nonsuicidal poets. *Psychosomatic Medicine, 63*, 517-522.
- (91) Stone, A. A., Smyth, J. M., Kaell, A., & Hurewitz, A. (2000). Structured writing about stressful events: Exploring potential psychological mediators of positive health effects. *Health Psychology, 19*(6), 619-624.
- (92) Stroebe, M., Schut, H., & Stroebe, W. (2006). Who benefits from disclosure? Exploration of attachment style differences in the effects of expressing emotions. *Clinical Psychology Review, 26*, 66-85.
- (93) Swanbon, T., Boyce, L., & Greenberg, M. A. (2008). Expressive writing reduces avoidance and somatic complaints in a community sample with constraints on expression. *British Journal of Health Psychology, 13*, 53-56.
- (113) Tauton, R. L. (1989). Replication: Key to research application. *Dimensions of Critical Care Nursing, 8*(3), 156-158.
- (104) Turner, R. J., Lloyd, D. A., & Roszell, P. (1999). Personal resources and the social distribution of depression. *American Journal of Community Psychology, 27*(5), 643-672.
- (138) Urry, H. L., van Reekum, C. M., Johnstone, T., & Davidson, R. J. (2009). Individual differences in some (but not all) medial prefrontal regions reflect cognitive demand while regulating unpleasant emotion. *NeuroImage, 47*(3), 852-863.
- (94) Van Middendorp, H., & Geenen, R. (2008). Poor cognitive-emotional processing may impede the outcome of emotional disclosure interventions. *British Journal of Health Psychology, 13*, 49-52.

- (95) Wagner, L. J. (2002). *Health effects of emotional disclosure through writing: An empirical, theoretical and methodological review*. Unpublished manuscript, Vanderbilt University.
- (96) Wagner, L. J., Hilker, K. A., Hepworth, J. T., & Wallston, K. A. (2008). Cognitive adaptability as a moderator of expressive writing effects in an HIV sample [available online]. *AIDS and Behavior*, *ISSN 1573-3254*, SpringerLink.
- (97) Warner, L. J., Lumley, M. A., Casey, R. J., Pierantoni, W., Salazar, R., Zoratti, E. M., et al., (2006). Health effects of written emotional disclosure in adolescents with asthma: A randomized, controlled trial. *Journal of Pediatric Psychology*, *31*(6), 557-568.
- (98) Weinman, J., Ebrecht, M., Scott, S., Walburn, J., & Dyson, M. (2008). Enhanced wound healing after emotional disclosure intervention. *British Journal of Health Psychology*, *13*, 95-102.
- (105) Wu, A. W., Jacobson, D., & Malitz, F. E. (1997). Evidence for reliability, validity, and usefulness of the Medical Outcomes Study Health Survey (MOS-HIV). *Quality of Life Research*, *6*(6), 481-493.
- (99) Zakowski, S. G., Ramati, A., Morton, C., Johnson, P., & Flanigan, R. (2004). Written emotional disclosure buffers the effects of social constraints on distress among cancer patients. *Health Psychology*, *23*(6), 555-563.